Ingersoll Rand®

# Engine Starting Systems

# It All Starts with Ingersoll Rand

For over a half century, Ingersoll Rand has delivered the most reliable air starters for use in the world's most demanding industries and environments. With over 200 models, we have more installations in more applications around the world than any other manufacturer.

- **Leader in Air Starting**
  *broad line of turbine starters, vane starters and barring motors*
- **Best-in-class Performance**
  *horsepower, torque and efficiency*
- **Culture of Innovation**
  *latest technology and superior engineering*
- **Lab Tested, Field Proven**
  *rugged components ensure reliability in harsh conditions*
- **Global Support**
  *worldwide sales, service and engineering*

We invite you to peruse our catalog, learn more about our wide range of products and discover for yourself why the biggest names in the business trust Ingersoll Rand air starters.

GENUINE OEM APPROVED

*Catalog pages with this symbol describe Ingersoll Rand products specified as "original equipment" by global engine manufacturers.*

## International Certifications

**ISO 9001:2000 — ABS (American Bureau of Shipping) — Lloyd's Register Germanischer Lloyd (www.germanlloyd.org) — Korean Register of Shipping**

*Certificate information available upon request.*

ABS — Lloyd's Register TYPE APPROVED — Germanischer Lloyd

## Air Starter Industry Selection Guide


| ENGINE STARTER SERIES | Locomotive | Marine | Off-Highway | Oil & Gas | Power Generation | Transportation |
|---|---|---|---|---|---|---|
| **TURBINE STARTERS** | | | | | | |
| 150T "F" Series | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ST400 | | ✓ | | | ✓ | |
| ST500 | | ✓ | ✓ | ✓ | ✓ | |
| ST600 | | ✓ | ✓ | | ✓ | |
| ST700/ST900 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ST1000/ST1000M | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **VANE STARTERS** | | | | | | |
| SS100 | | ✓ | ✓ | ✓ | ✓ | ✓ |
| SS350 | | ✓ | ✓ | ✓ | ✓ | ✓ |
| 150BM | | ✓ | ✓ | ✓ | ✓ | ✓ |
| SS800 | | ✓ | ✓ | ✓ | ✓ | |
| **GAS TURBINE STARTERS** | | | | | | |
| TS700/TS900/TS1400 | | | | ✓ | ✓ | |
| **BARRING MOTORS** | | | | | | |
| B006 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| T480 | ✓ | ✓ | ✓ | ✓ | ✓ | |

# Contents

# High-Performance from Start to Finish

## *Turbine Starters*

**Patented slip-fit, modular motor design** makes servicing simple and convenient.

From the remotest mines to the open seas, Ingersoll Rand turbine air starters withstand the toughest environmental and working conditions.
Robust features and flexibility combine to deliver reliable, heavy-duty starting power for a wide range of industrial, oil and gas, marine, power generation, rail and mining applications.

Unlike cantilever designs, our fully-supported, high-speed rotors extend bearing life by minimizing deflection and ensuring concentric operation.
Add in our lightweight, lube-free and field-serviceable motor design, and it's no wonder Ingersoll Rand turbine air starters are specified by premier engine OEMs across the globe.

- Lube-free turbine motor
- Easy field serviceability
- Robust gearing handles long crank cycles
- Fully-supported rotor for longer bearing life
- Sealed, oil-lubricated planetary sets (preferred worldwide for high-performance gear trains)
- Solid aluminum rotor design tames harsh, contaminated environments*
- Modular motor design shares components with vane starters to reduce parts inventory
- Proven Ingersoll Rand front-end engagement system for greater reliability
- Class-leading power, durability and efficiency

** ST1000 Series*

## Turbine Starter Selection Guide (Lubrication Free)

| For Diesel Engine Displacement (liters) | Catalog Pages | Series | Gear Ratio | Extended Starting Capability (>10 sec.) | Max Power (hp) | Max Pressure psi (bar) | Air Consumption at Max HP scfm (L/s) | Engagement Type** | Inlet Size (NPT) | Exhaust Size (NPT) | Gas Sealed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 to 27 | 7-9 | 150TMG | F | Yes | 28 | 150 (10.3) | 710 (335) | Inertia | 1 1/4" | 2" | Yes |
| 8 to 27 | 7-9 | 150TMP | F | Yes | 28 | 150 (10.3) | 710 (335) | Pre-Engaged | 1 1/4"" | 2" | Yes |
| 8 to 70 | 7-9 | 150TLP | F | Yes | 28 | 90 (6.2) | 780 (368) | Pre-Engaged | 1 1/4" | 2" | Yes |
| 5 to 60 | 10-11 | ST400 | C | Yes | 25 | 150 (10.3) | 750 (354) | Pre-Engaged | 1" | NA | No |
| 5 to 60 | 10-11 | ST455 | C | Yes | 23 | 120 (8.3) | 780 (368) | Pre-Engaged | 1" | NA | No |
| 5 to 60 | 12-14 | ST499 | C | Yes | 26 | 90 (6.2) | 765 (361) | Pre-Engaged | 1" | NA | No |
| 5 to 100 | 12-14 | ST599 | F | Yes | 44 | 150 (10.3) | 1240 (585) | Pre-Engaged | 1 1/4" | 2" | Yes |
| 5 to 100 | 15-16 | ST544 | F | Yes | 28 | 150 (10.3) | 710 (335) | Pre-Engaged | 1 1/4" | 2" | Yes |
| 16 to 80 | 15-16 | ST650 | B | Yes | 66 | 150 (10.3) | 1450 (684) | Pre-Engaged | 1 1/4" | 5" V-Band Flange | No |
| 16 to 80 | 15-16 | ST699 | B | Yes | 67 | 90 (6.2) | 1700 (802) | Pre-Engaged | 1 1/2" | 5" V-Band Flange | No |
| 16 to 130 | 17-20 | ST750/ ST950 | B | No/Yes | 55 | 150 (10.3) | 1300 (614) | Inertia/ Pre-Engaged | 1 1/2" | 4" * | Yes |
| 16 to 130 | 17-20 | ST750/ ST999 | B | No/Yes | 66 | 90 (6.2) | 1700 (802) | Inertia/ Pre-Engaged | 1 1/2" | 4" * | Yes |
| 80 to 200 | 17-20 | ST750/ ST950 | C | No/Yes | 55 | 150 (10.3) | 1300 (614) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| 80 to 200 | 17-20 | ST750/ ST999 | C | No/Yes | 66 | 90 (6.2) | 1700 (802) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| 16 to 130 | 21-24 | ST1060 | B | Yes | 70 | 150 (10.3) | 1290 (609) | Inertia/ Pre-Engaged | 1 1/2" | 4" * | Yes |
| 16 to 130 | 21-24 | ST1099 | B | Yes | 68 | 90 (6.2) | 1240 (585) | Inertia/ Pre-Engaged | 1 1/2" | 4" * | Yes |
| 80 to 200 | 21-24 | ST1060 | C | Yes | 70 | 150 (10.3) | 1290 (609) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| 80 to 200 | 21-24 | ST1099 | C | Yes | 68 | 90 (6.2) | 1240 (585) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| 160 to 320 | 21-24 | ST1060 | D | Yes | 70 | 150 (10.3) | 1290 (609) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| 160 to 320 | 21-24 | ST1099 | D | Yes | 68 | 90 (6.2) | 1240 (585) | Pre-Engaged | 1 1/2" | 4" * | Yes |
| Gas Turbine Engines | 39-44 | TS700/ TS900 | D | Yes | 130 | 225 (15.5) | 2200 (1038) | Permanently Engaged | 1 1/2" | 4" * | Yes |

* Or exhaust through a welded flanged 3 1/2" schedule 40 pipe.

These figures are only a guide. For difficult-to-start engines or for operation under adverse conditions, use the next more powerful starter. For 2-stroke diesel engines, these figures may be multiplied by 1.5. Ex: a 150TMG could be used in a 41 liter 2-stroke diesel engine. For carbureted (gas) engines, these figures may be doubled. Ex: a 150BMP could be used on a 54 liter gasoline engine. Note 1 liter = 61.02 $in^3$.

** There are two basic types of air starters: pre-engaged and inertia. With pre-engaged starters, the drive pinion is completely engaged with the engine ring gear before the starter begins to crank the engine. With an inertia starter, the rotating drive pinion engages the engine ring gear simultaneously with the initial cranking of the engine.

# 150™ "F" Series

GENUINE OEM APPROVED

**For engine displacement of:**
Diesel–500 to 4300 CID (8 to 70 liters)
Carbureted–1000 to 8600 CID (16 to 140 liters)

## Features/Benefits

- Efficient 36 hp turbine motor uses no external lubrication
- Same inlet and outlet locations as the 150BM Series starters for easy change-out
- Uses the proven front end of the 150BM starter
- Sealed, oil-lubricated planetary gears provide maintenance-free operation

## Versatile

- Sealed for use in gas and air applications
- Inertia and pre-engaged models
- Left- and right-hand rotation
- 4 inlet, 4 exhaust, and 16 drive housing orientations
- 30-150 psi (2.1-10.3 bars) operation

## Industry Applications

MARINE | OIL & GAS | OFF-HIGHWAY | LOCOMOTIVE | TRANSPORTATION | POWER GENERATION



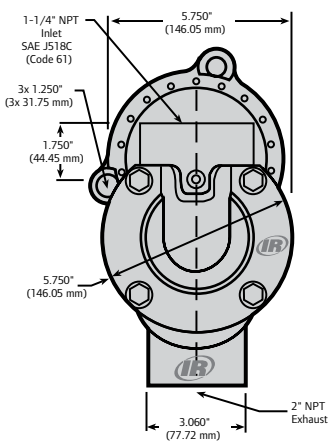


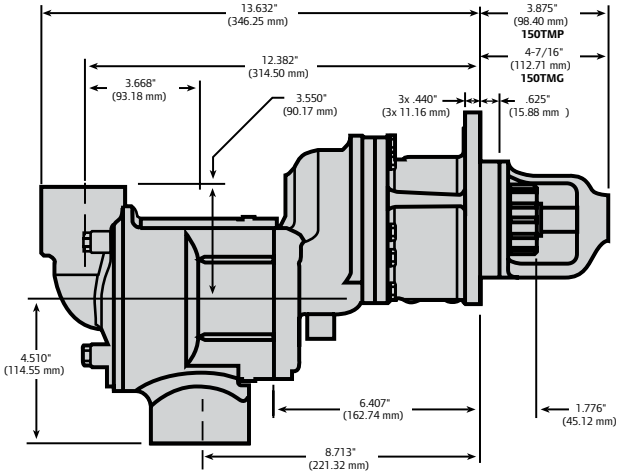
Ingersoll Rand

## Dimensions

Weight: 35 lbs (15.9 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.

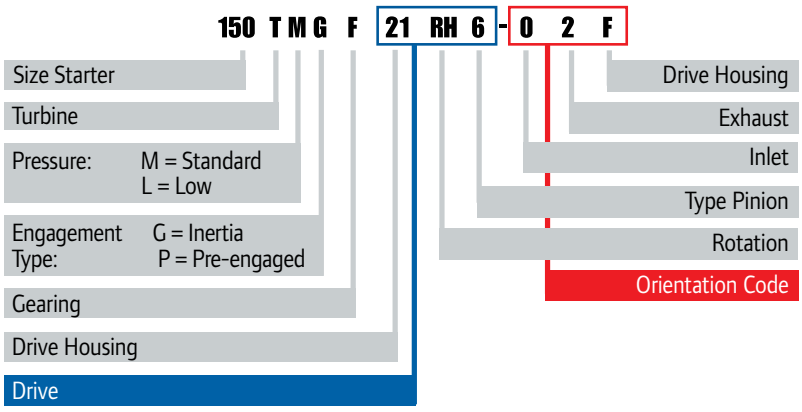



## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **150TMPF/150TMGF – 44% ARC** | | | | |
| 60 (4.1) | 74 (100) | 1296 | 9 (7) | 310 (146) |
| 90 (6.2) | 113 (153) | 1480 | 16 (12) | 430 (203) |
| 120 (8.3) | 147 (200) | 1580 | 22 (17) | 570 (269) |
| 150 (10.3) | 182 (247) | 1620 | 28 (21) | 710 (335) |
| **150TLPF – 99% ARC** | | | | |
| 30 (2.1) | 72 (98) | 1185 | 8 (6) | 340 (160) |
| 60 (4.1) | 132 (179) | 1500 | 19 (14) | 580 (274) |
| 90 (6.2) | 206 (280) | 1530 | 30 (23) | 780 (368) |
| 120 (8.3) | 247 (336) | 1540 | 36 (46) | 1000 (475) |

## Model Coding




## Simple Crossover:

Current 150BM models are superseded to the 150T™ "F" models by replacing the "B" with a "T" and the "E" with an "F".

*Example:*
150**B**MP**E**88R54 = 150**T**MP**F**88R54

For low pressure applications (less than 90 psi or 6.2 bar) replace the "M" with an "L".

*Example:*
150T**M**PE88R54 = 150T**L**PF88R54

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | ST500-674 or 150T-312 | 2" Muffler |
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |
|  | SRV125F | 1-1/4" Relay/Solenoid Valve |
|  | SRV125T | 1-1/4" Relay Valve for Transit Aftermarket |
| | SRV125 | 1-1/4" Relay Valve for Stationary Air |
|  | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | 150BMP-1058 | Gladhand |

| | Part # | Description |
|---|---|---|
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
|  | ST500-A735 | 2" Road Splash Deflector |
|  | 150BMP-1056 | 1/2" Check Valve |
|  | 150BMP-1067 | 1/2" Drain Valve |
|  | ST500-K166 | SAE J518 Split Flange |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| 150TMP-TK1 | 150T Pre-engaged Starter Tune Up Kit |
| 150TMG-TK1 | 150T Inertia Starter Tune Up Kit |

*150TMP-TK1 Parts*

*150TMG-TK1 Parts*

## Motor Modules

| Motor Module Part Number | Description |
|---|---|
| 150TMFR-100 | RH Half Arc Motor Module |
| 150TMFL-100 | LH Half Arc Motor Module |
| 150TLFR-100 | RH Half Arc Motor Module |
| 150TLFL-100 | LH Half Arc Motor Module |

**Note:** The motor module can be used to convert an E ratio to an F ratio 150T starter and includes the motor and the gearing section.

## ST400 Series

**For engine displacement of:**
Diesel–300 to 3600 CID (5 to 60 liters)

## Industry Applications

MARINE

POWER GENERATION

## Features/Benefits

- Efficient 26 hp turbine motor uses no external lubrication
- One-hose hookup simplifies required piping
- In-line design weighs only 23 lbs (10.4 kg)
- Sealed oil-bath lubrication for gears and bearings provides maintenance free operation

## Versatile

- Removable mounting flange can be rotated 360 degrees for greater mounting flexibility
- Compact, lightweight design makes installation easy
- Overhung pinion design fits most worldwide manufacturers' engines
- 30-150 psi (2.1-10.3 bars) operation

## Model Coding

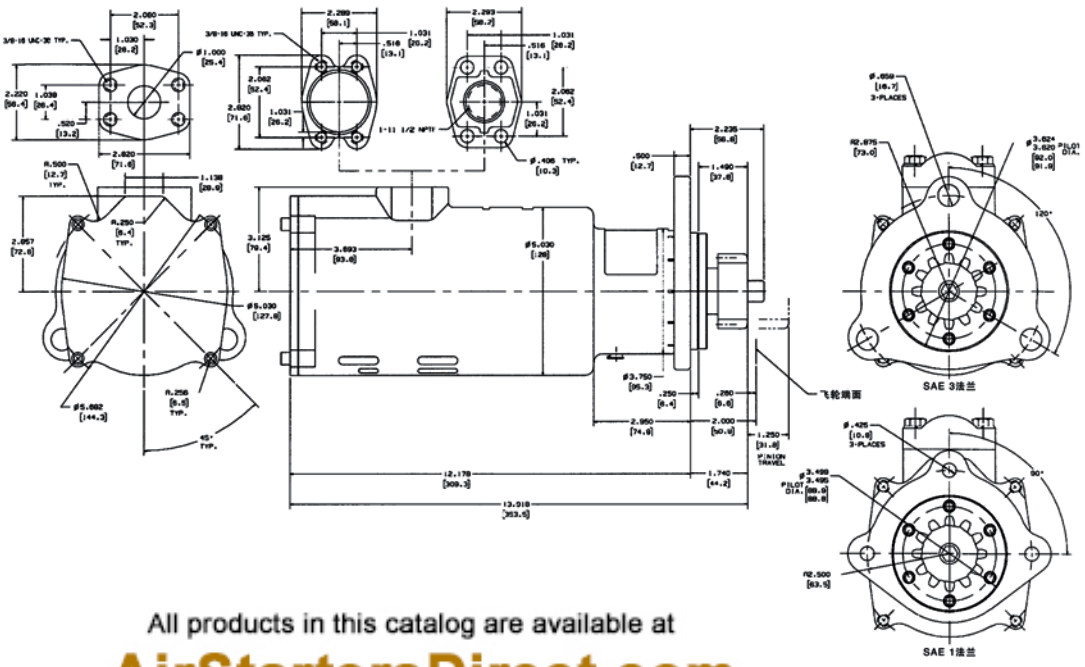
**ST400 I C 03 R 31**

| | |
|---|---|
| ST400 - 44% ARC<br>Max. 10.3 bar<br>ST455 - 55% ARC<br>Max. 8.3 bar<br>ST499 - 99% ARC<br>Max. 6.2 bar | |
| I = 1" NPT<br>No letter = SAE Split Flange | |
| C = Gear Ratio | |
| | 01 = SAE 1 Flange<br>03 = SAE 3 Flange |
| | R = Right Hand<br>L = Left hand |
| | Pinion Code |

## Dimensions

Weight: 38 lbs (17.2 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



# Turbine Starters

## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **ST400 – 44% ARC** | | | | |
| 90 (6.2) | 90 (122) | 1500 | 14 (10) | 430 (203) |
| 120 (8.3) | 120 (163) | 1650 | 19 (14) | 600 (284) |
| 150 (10.3) | 150 (203) | 1650 | 25 (19) | 750 (354) |
| **ST455 – 55% ARC** | | | | |
| 60 (4.1) | 80 (109) | 1400 | 10 (7) | 23 (17) |
| 90 (6.2) | 135 (183) | 1450 | 18 (13) | 650 (307) |
| 120 (8.3) | 185 (251) | 1500 | 23 (17) | 780 (368) |
| **ST499 – 99% ARC** | | | | |
| 30 (2.1) | 50 (68) | 1550 | 7 (5) | 320 (251) |
| 60 (4.1) | 115 (156) | 1600 | 14 (10) | 550 (260) |
| 90 (6.2) | 185 (251) | 1650 | 26 (19) | 765 (361) |

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | SMB-618 | Push Button Valve |
|  | SRV125F | 1-1/4" Relay/Solenoid Valve |
|  | SRV125T | 1-1/4" Relay Valve for Transit Aftermarket |
| | SRV125 | 1-1/4" Relay Valve for Stationary Air |
|  | SRV150 | 1-1/2" Relay Valve |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
|  | ST400-A339M | Manual Control Valve |

*For complete filter (strainer + housing), plea

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | ST400-C339 | Relay Valve with top-mounted Solenoid |
|  | ST400-K17 | 1" NPT Flange Kit |
|  | ST400-16 | SAE J518 Split Flange |

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| **Liner Assembly** | |
| ST400-A41R | Standard Arc Right Hand |
| ST400-A41L | Standard Arc Left Hand |
| ST455-A41R | 55% Arc Right Hand |
| ST455-A41L | 55% Arc Left Hand |
| ST499-A41R | Full Arc Right Hand |
| ST499-A41L | Full Arc Left Hand |

# ST500 Series

**For engine displacement of:**
Diesel–500 to 6000 (8 to 100 liters)
Carbureted–1000 to 12,000 CID (16 to 200 liters)

## Features/Benefits

- Powerful 44 hp turbine motor uses no external lubrication
- Steel insert at inlet ensures a solid connection
- Smooth pre-engagement piston minimizes ring gear wear
- Sealed, oil-lubricated planetary gears provide maintenance-free operation

## Versatile

- Sealed for use in gas and air applications
- For use with air or natural gas
- 4 inlet, 4 exhaust, and 16 drive housing orientations
- Left- or right-hand rotation
- Optional pinions and flanges to fit most engines
- 30-150 psi (2.1-10.3 bars) operation

## Industry Applications

MARINE

OIL & GAS

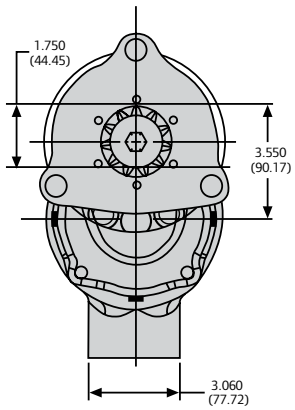
OFF-HIGHWAY

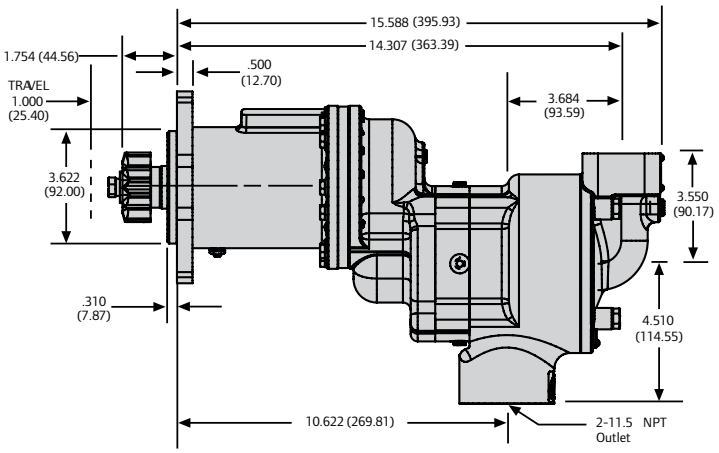
POWER GENERATION

## Dimensions

Weight: 38 lbs (17.2 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **ST544** | | | | |
| 60 (4.1) | 74 (100) | 1296 | 9 (7) | 310 (146) |
| 90 (6.2) | 113 (153) | 1480 | 16 (12) | 430 (203) |
| 120 (8.3) | 147 (200) | 1580 | 22 (17) | 600 (284) |
| 150 (10.3) | 182 (247) | 1620 | 28 (21) | 750 (354) |
| **ST599** | | | | |
| 30 (2.1) | 72 (98) | 1185 | 8 (6) | 340 (160) |
| 60 (4.1) | 132 (179) | 1500 | 19 (14) | 580 (274) |
| 90 (6.2) | 206 (280) | 1530 | 30 (23) | 780 (368) |
| 120 (8.3) | 247 (336) | 1540 | 36 (46) | 1000 (475) |
| 150 (10.3) | 295 (400) | 1560 | 44 (58) | 1240 (585) |

## Model Coding

**ST544 F 03 R 25 - 0 2 F J**

- Size Starter
- Gear Ratio
- Flange:
  - 01 = SAE 01
  - 03 = SAE 03
  - 24 = Mitsubishi
  - 26 = Mitsubishi
- Rotation
- Type of pinion
- Flange
- Drive Mounting
- Exhaust
- Inlet

# Turbine Starters

## Parts and Accessories

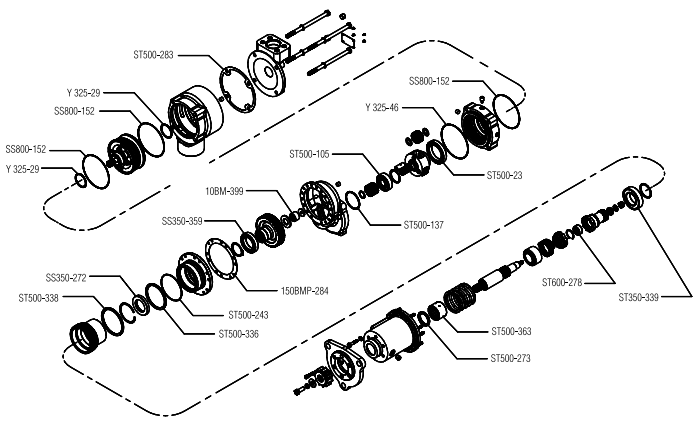
| | Part # | Description |
|---|---|---|
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |
|  | SRV125T | 1-1/4" Relay Valve for Transit Aftermarket |
| | SRV125 | 1-1/4" Relay Valve for Stationary Air |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | ST500-A735 | 2″ Road Splash Deflector |

| | Part # | Description |
|---|---|---|
|  | ST500-K166 | SAE J518 Split Flange |
|  | 150BMP-1056 | 1/2″ Check Valve |
|  | 150T-312 | 2″ Muffler |
|  | SMB-441 | Liquid Sealant |
|  | *ST900-267H/150 | 1-1/2″ Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2″ Strainer (50 microns) |

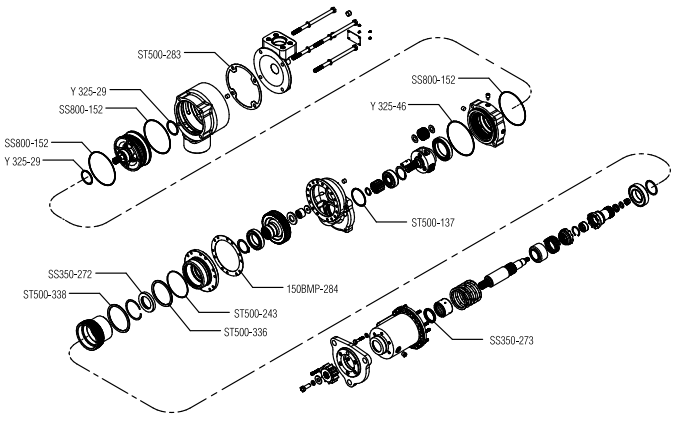
*For complete filter (strainer + housing), please order ref ST900-267/150-HP

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| ST500-TK1 | ST500 Starter Tune Up Kit |
| ST500-SK1 | ST500 Seal Kit |




*Exploded View of ST500-TK1 Part Location*




*Exploded View of ST500-SK1 Part Location*

# ST600 Series

**For engine displacement of:**
Diesel–1000 to 5000 CID (16 to 80 liters)
Carbureted–2000 to 10,000CID (32 to 160 liters)

## Features/Benefits

- Powerful 67 hp turbine motor uses no external lubrication
- Extended pilot for easier installation
- Offset pre-engaged ports for greater fitting positioning
- Smooth pre-engagement for limited ring gear wear
- 39 lb (17.7 kg) weight makes it the lightest starter in its class

## Versatile

- In-line design and lightweight make installation easy
- Left or right-hand rotation
- 8 orientation options
- 30-150 psi (2.1-10.3 bars) operation
- For use with air only

## Industry Applications

MARINE

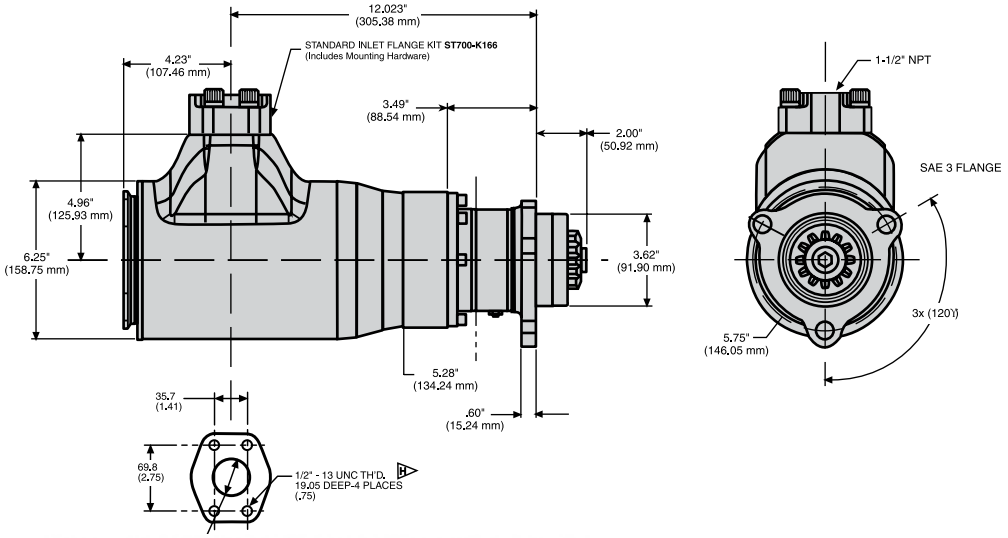
OFF-HIGHWAY

POWER GENERATION

## Dimensions

Weight: 39 lbs (17.7 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




**Inlet Flange Kit (ST700-K166)**
Weight: 4.5 lbs (2.0 kg)

## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **ST650B** | | | | |
| 90 (6.2) | 155 (210) | 2300 | 34 (25) | 850 (401) |
| 120 (8.3) | 225 (305) | 2350 | 50 (37) | 1150 (543) |
| 150 (10.3) | 260 (352) | 2600 | 65 (49) | 1450 (684) |
| **ST699B** | | | | |
| 30 (2.1) | 110 (149) | 1950 | 20 (15) | 600 (283) |
| 60 (4.1) | 195 (264) | 2200 | 41 (31) | 1150 (543) |
| 90 (6.2) | 290 (393) | 2400 | 67 (50) | 1700 (802) |

**Note:** Overtorque safety clutch set between 330 to 440 ft-lb (447 to 596 Nm)

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |
|  | SRV150 | 1-1/2" Relay Valve |
|  | 150BMP-1058 | Gladhand |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | ST900-267H/150 | 1-1/2" Strainer Housing |
|  | ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
|  | 150BMP-1056 | 1/2" Check Valve |
|  | 150BMP-1067 | 1/2" Drain Valve |

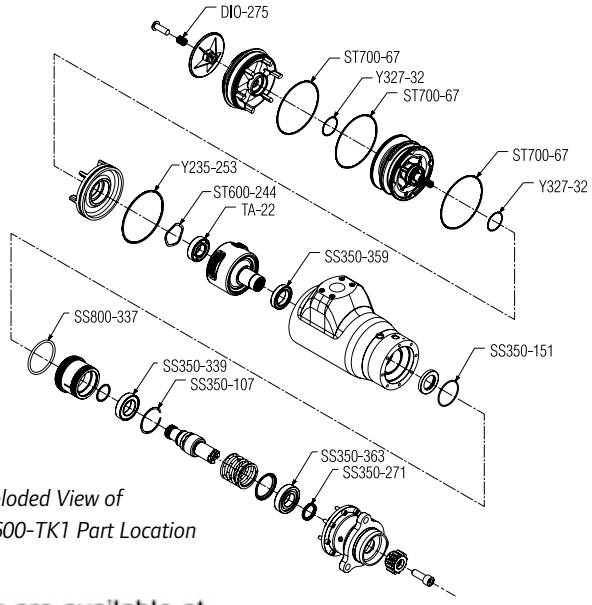
## Model Coding

**ST6 50 B P 03 R 31**

- ST6 — Turbine Starter Series
- 50 — Percent Arc
- B — Gear Ratio
- P — Pre-engaged
- 03 — SAE Flange
- R — Rotation
- 31 — Pinion

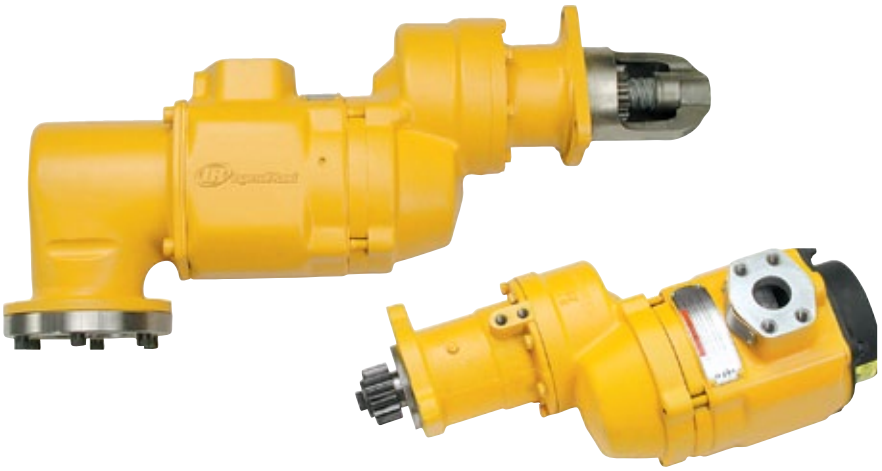
## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| ST600-TK1 | ST600 Starter Tune Up Kit |
| ST600-SK1 | ST600 Starter Seal Kit |




*Exploded View of ST600-TK1 Part Location*

# ST700/900 Series



**For engine displacement of:**
Diesel–1000 to 20,000 CID
(16 to 320 liters)
Carbureted–2000 to 40,000 CID
(32 to 660 liters)

## Features/Benefits

- Powerful 66 hp turbine motor uses no external lubrication
- Robust gearing handles extended crank cycles
- B and C gearing options provide a broad range of starting torques
- Sealed, oil-lubricated planetary gears provide maintenance-free operation

## Versatile

- Sealed for use in gas and air applications
- Left- or right-hand rotation
- 4 inlet, 4 exhaust, and 16 housing orientations
- 30-150 psi (2.1-10.3 bars) operation
- Inertia and pre-engaged drives

## Industry Applications

MARINE

OIL & GAS

OFF-HIGHWAY

LOCOMOTIVE

POWER GENERATION

## Model Coding for ST700

**ST7 50 G B D P 03 R 31 - 2 P**

- ST7 — Turbine Starter Series
- 50 — Percent Arc
- G — Gas Sealed
- B — Gear Ratio: B = 2.18-1, C = 2.53-1
- D — Type Gear Case
- P — Engagement Type: I = Inertia, P = Pre-engaged
- 03 — SAE Flange
- R — Rotation
- 31 — Type Pinion
- 2 — Inlet
- P — Orientation Code w/o Exhaust Elbow
- Drive Housing

## Model Coding for ST900

**ST9 50 B P 03 R 31 - 0 2 G**

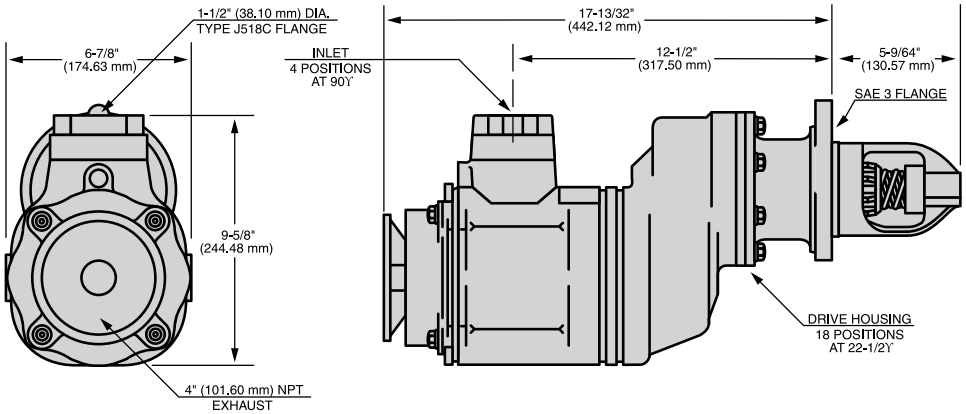
- ST9 — Turbine Starter Series
- 50 — Percent Arc
- B — Gear Ratio: B = 2.18-1, C = 2.53-1
- P — Engagement Type: I = Inertia, P = Pre-engaged
- 03 — SAE Flange
- R — Rotation
- 31 — Pinion
- 0 — Inlet
- 2 — Exhaust
- G — Orientation Code w/o Exhaust Elbow
- Drive Housing

## Dimensions

**ST750/ST799GBI & ST950/ST999BI Inertia**

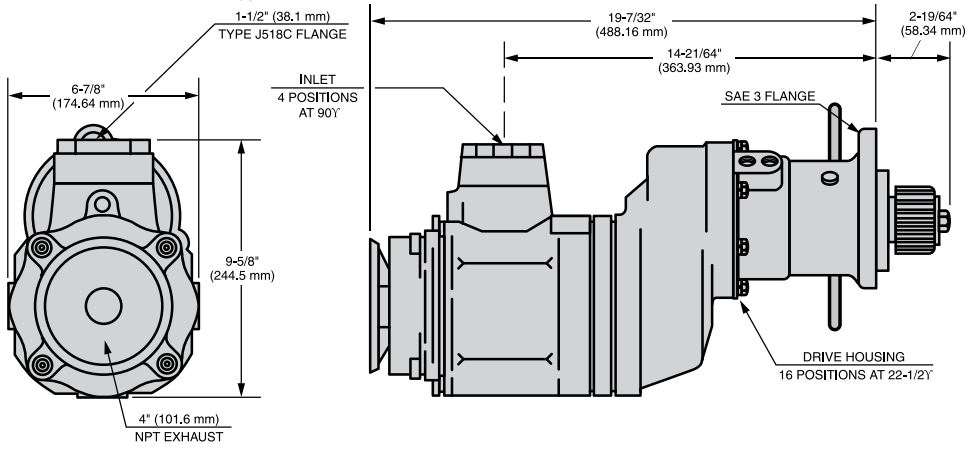
Weight:
ST750/ST799GBI 62 lbs (28.1 kg)
ST950/ST999BI 62 lbs (28.1 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




**ST750/ST799 & ST950/ST999 B & C Ratio Pre-engaged**

Weight:
ST750/ST799GBPD 63 lbs (28.6 kg)
ST950/ST999BP 63 lbs (28.6 kg)




## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **ST750/ST950 B Ratio (Inertia & Pre-engaged)** | | | | |
| 90 (6.2) | 160 (217) | 1950 | 30 (22) | 850 (401) |
| 120 (8.3) | 225 (305) | 2100 | 45 (34) | 1100 (519) |
| 150 (10.3) | 250 (339) | 2350 | 55 (41) | 1300 (614) |
| **ST799/ST999 B (Inertia & Pre-engaged)** | | | | |
| 30 (2.1) | 110 (149) | 1750 | 18 (13) | 700 (330) |
| 60 (4.1) | 195 (264) | 1950 | 36 (27) | 1200 (566) |
| 90 (6.2) | 310 (420) | 2250 | 66 (49) | 1700 (802) |
| **ST750/ST950 C Ratio (Pre-engaged)** | | | | |
| 90 (6.2) | 190 (257) | 1675 | 30 (22) | 850 (401) |
| 120 (8.3) | 260 (352) | 1800 | 45 (34) | 1100 (519) |
| 150 (10.3) | 285 (386) | 2000 | 55 (41) | 1300 (614) |
| **ST799/ST999 C Ratio (Pre-engaged)** | | | | |
| 30 (2.1) | 130 (175) | 1500 | 18 (13) | 700 (330) |
| 60 (4.1) | 225 (305) | 1630 | 36 (27) | 1200 (566) |
| 90 (6.2) | 360 (485) | 1935 | 66 (49) | 1700 (802) |

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |
|  | SRV150 | 1-1/2" Relay Valve for Air |
| | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | 150BMP-1058 | Gladhand |

| | Part # | Description |
|---|---|---|
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
| | ST900-267H/200 | 2'' Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
| | ST900-266/200-HP | 2" Strainer Element (50 microns) |
|  | 150BMP-1056 | 1/2" Check Valve |
|  | 150BMP-1067 | 1/2" Drain Valve |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

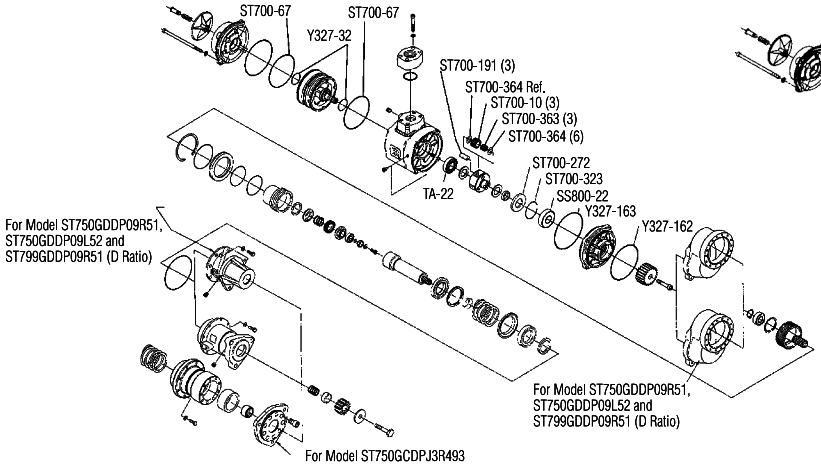
## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| ST700-TK1 | ST700 Starter Tune Up Kit |
| ST700I-TK6 | ST700 Inertia Front End Tune Up Kit |
| ST700P-TK7 | ST700 Pre-Engaged Front End Tune Up Kit |
| ST700D-TK8 | ST700 and ST900 D Ratio Kit (4 O-Rings, 1 Retainer Ring) |
| ST750R-TK2 | ST700-TK1 and ST750R-A53 Motor Assembly for RH ST750 Starters |

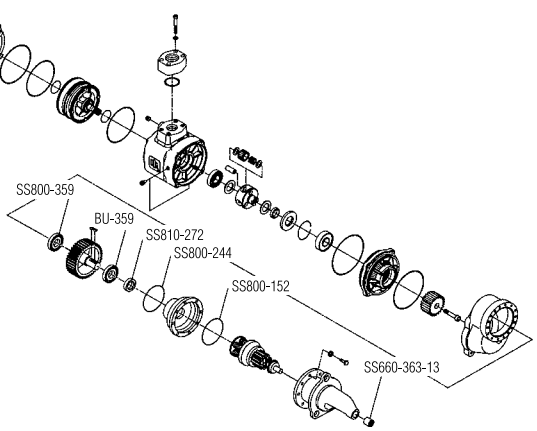
| Tune Up Kit Part Number | Description |
|---|---|
| ST750L-TK3 | ST700-TK1 and ST750L-A53 motor assembly for LH ST750 starters |
| ST799R-TK4 | ST700-TK1 and ST799R-A53 motor assembly for RH ST799 starters |
| ST799L-TK5 | ST700-TK1 and ST799L-A53 motor assembly for LH ST799 starters |
| ST900-GK1 | ST900 Gear Kit |
| ST900-SK1 | ST900 Seal Kit |

*ST700-TK1 Parts*

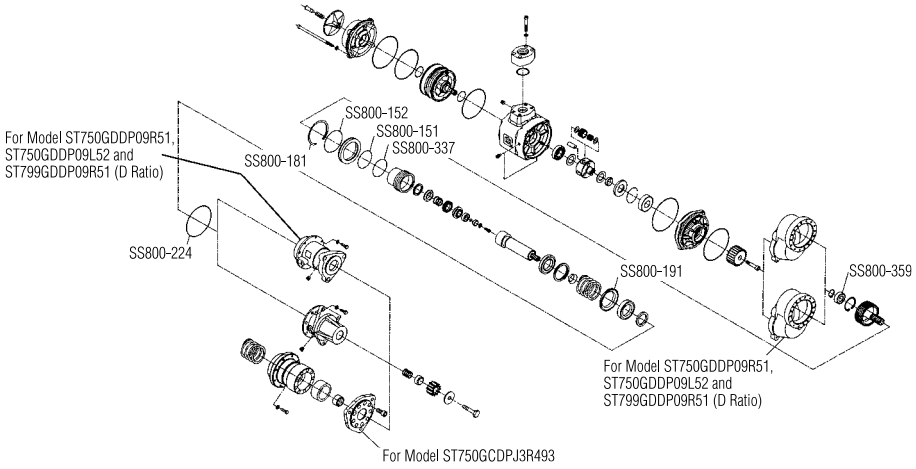
*ST700P-TK7 Parts*



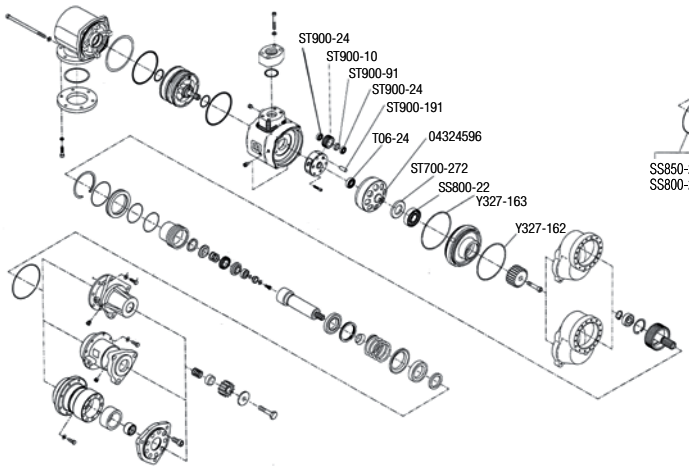

*Exploded View of ST700-TK1 Part Location*



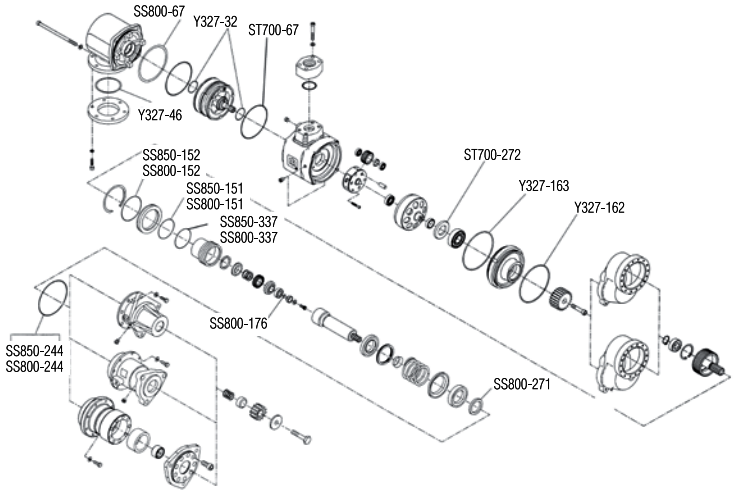

*Exploded View of ST700I-TK6 Part Location*




*Exploded View of ST700P-TK7 Part Location*

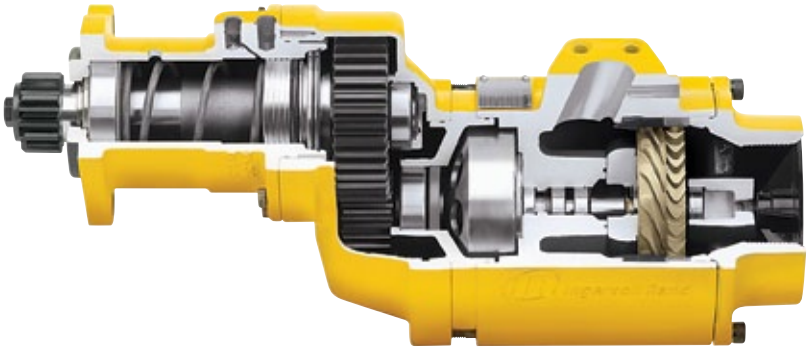



*Exploded View of ST900-GK1 Part Location*




*Exploded View of ST900-SK1 Part Location*

# ST1000/ST1000M Series



**For engine displacement of:**
Diesel–1000 to 20,000 CID
(16 to 320 liters)
Carbureted–2000 to 40,000 CID
(32 to 660 liters)

## Features/Benefits

- Powerful 70 hp turbine motor uses no external lubrication and offers best in class efficiency
- Patented, solid aluminum motor design enables reliable operation in harsh, contaminated environments
- Robust gearing handles extended crank cycles
- Patented, fully-supported high-speed rotor extends bearing life by minimizing deflection and ensuring concentric running; a better alternative to cantilever designs

## Versatile

- Sealed for use in gas and air applications
- Left- or right-hand rotation available
- 4 inlet, 4 exhaust, and 16 housing orientations
- 30-150 psi (2.1-10.3 bars) operation
- Inertia and pre-engaged drives available
- Patented slip-fit motor design makes servicing simple and convenient
- ST1000M version with 2-inch NPT inlet reduces the need for piping changes on some competitive models

## Industry Applications

MARINE

OIL & GAS

OFF-HIGHWAY

LOCOMOTIVE

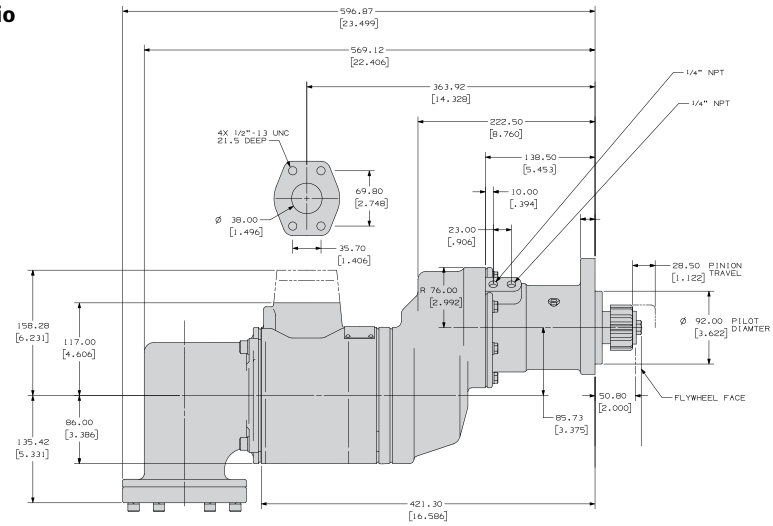
POWER GENERATION

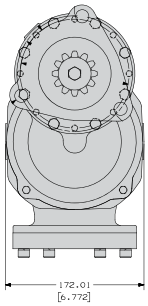
## Dimensions

### Pre-Engaged B & C Ratio

Weight: 76 lbs (34.5 kg)

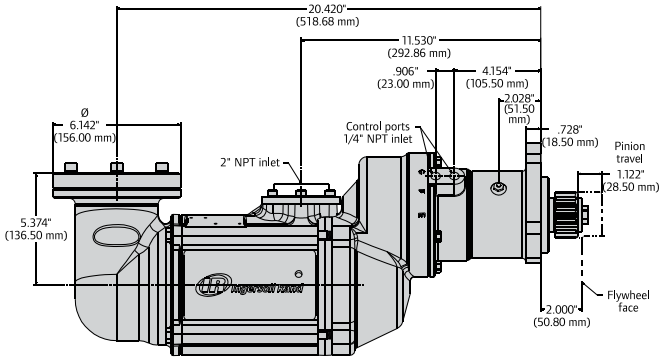
**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.

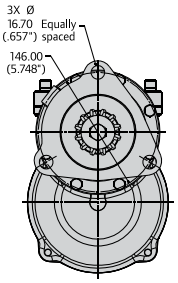



### ST1000M

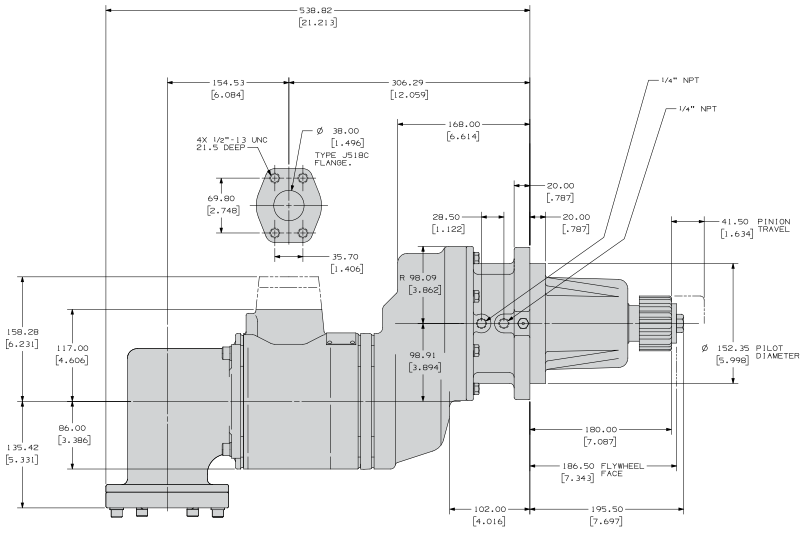
**Weight:** 76 lbs (34.5 kg)

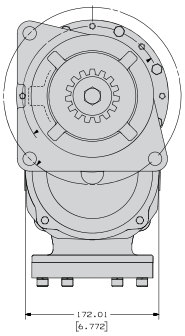



### Pre-Engaged D Ratio

**Weight:** 102 lbs (46.3 kg)



## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **ST1060 B Ratio** | | | | |
| 30 (2) | 53 (71) | 1175 | 7 (5) | 370 (175) |
| 60 (4) | 115 (156) | 1550 | 20 (15) | 590 (278) |
| 90 (6) | 220 (298) | 1780 | 39 (29) | 820 (387) |
| 120 (8) | 295 (400) | 1900 | 53 (39) | 1050 (496) |
| 150 (10) | 353 (478) | 2050 | 70 (52) | 1290 (609) |
| **ST1099 B Ratio** | | | | |
| 30 (2) | 82 (111) | 1425 | 13 (10) | 540 (255) |
| 60 (4) | 200 (271) | 1850 | 36 (27) | 890 (420) |
| 90 (6) | 347 (470) | 2060 | 68 (51) | 1240 (585) |
| **ST1060 C Ratio** | | | | |
| 30 (2) | 62 (84) | 1025 | 7 (5) | 370 (175) |
| 60 (4) | 143 (194) | 1350 | 20 (15) | 590 (278) |
| 90 (6) | 256 (347) | 1515 | 39 (29) | 820 (387) |
| 120 (8) | 342 (463) | 1675 | 53 (39) | 1050 (496) |
| 150 (10) | 409 (554) | 1780 | 70 (52) | 1290 (609) |
| **ST1099 C Ratio** | | | | |
| 30 (2) | 98 (133) | 1225 | 13 (10) | 540 (255) |
| 60 (4) | 234 (317) | 1580 | 36 (27) | 890 (420) |
| 90 (6) | 400 (542) | 1770 | 68 (51) | 1240 (585) |
| **ST1060 D Ratio** | | | | |
| 30 (2) | 85 (115) | 765 | 7 (5) | 370 (175) |
| 60 (4) | 195 (264) | 985 | 20 (15) | 590 (278) |
| 90 (6) | 326 (442) | 1125 | 39 (29) | 820 (387) |
| 120 (8) | 462 (626) | 1205 | 53 (39) | 1050 (496) |
| 150 (10) | 557 (755) | 1650 | 70 (52) | 1290 (609) |
| **ST1099 D Ratio** | | | | |
| 30 (2) | 132 (179) | 900 | 13 (10) | 540 (255) |
| 60 (4) | 318 (431) | 1170 | 36 (27) | 890 (420) |
| 90 (6) | 540 (732) | 1300 | 68 (51) | 1240 (585) |

# Turbine Starters

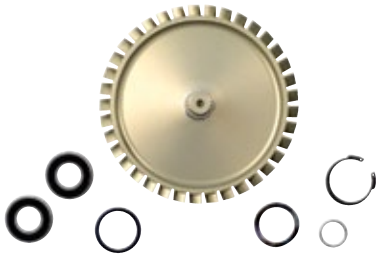
## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| ST700P-TK7 | Pre-engaged Tune Up Kit |
| ST700I-TK6 | Inertia Tune Up Kit |
| ST700D-TK8 | D Ratio Tune Up Kit |
| ST1000-SK1 | Seal Kit |
| ST1000-GK1 | Planetary Gear Kit |
| ST1000R-K53-37 | Rotor Replacement Kit (RH) |

| Tune Up Kit Part Number | Description |
|---|---|
| ST1000L-K53-37 | Rotor Replacement Kit (LH) |
| ST1000-K24 | Rotor Bearing Kit |
| ST1000R-K212 | Motor Adapter Kit (RH) |
| ST1000L-K212 | Motor Adapter Kit (LH) |
| ST1000K-562 | Straight Exhaust Kit |
| ST1000K-350 | Elbow Exhaust Kit |

*ST700P-TK7 Parts*

*ST1000-SK1 Parts*



*ST1000R-K53-37 and ST1000L-K53-37 Parts*

*ST1000K-350 Part*

## Parts and Accessories

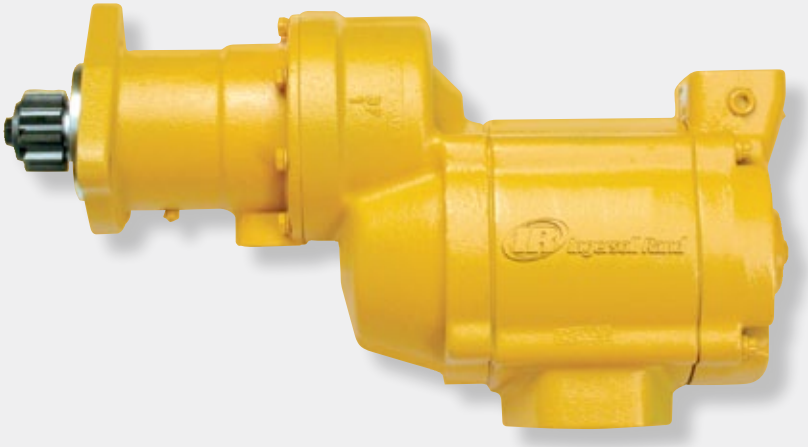
| | Part # | Description |
|---|---|---|
|  | ST700-K166 | Inlet Flange Kit |
|  | ST700-K351 | Exhaust Flange Kit |
|  | SRV150 | 1-1/2" Relay Valve for Air |
|  | SRV150SS | 1-1/2" Gas Rated Stainless Steel Relay Valve |
|  | *ST900-267H/150<br>ST900-267H/200 | 1-1/2" Strainer Housing<br>2″ Strainer housing |
|  | *ST900-266/150-HP<br>ST900-266/200-HP | 1-1/2″ Strainer (50 microns)<br>2" Strainer (50 microns) |

| | Part # | Description | |
|---|---|---|---|
|  | SMB-618 | Push Button Valve | |
|  | SMB-G618 | Gas Rated Push Button Valve | |
|  | 38600714 (RR152-F30) | High Pressure Regulator Relay Valve (for use with air only) | 1.5" 90 Degree |
| | 38754917 (RR152-F30-14) | | 1.5" In-line |
| | 16675845 (RR250-F30) | | 2.5" In-line |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

# Superior Engineering, Legendary Performance

*Vane Starters*



With their simple, rugged design, easy maintenance, and legendary durability, Ingersoll Rand vane starters reign as the most commonly used air starters in the world. Our vane motors develop maximum horsepower at speeds as low as 5000 RPM plus require only a small amount of lubrication for maximum life. This ability to thrive at lower speeds improves each motor's bearing life, minimizes planetary gear reduction and delivers more torque per pound than other displacement motors.

- High torque, lower RPMs
- Easy field serviceability
- Modular design shares components with turbine starters

Reliability and high-efficiency at a low cost have made our 150 BM and SS800 models the benchmark starters in their class.

## Vane Starters Selection Guide

| For Diesel Engine Displacement (liters) | Catalog Section | Series | Gear Ratio | Extended Starting Capability (>10 sec.) | Max Power (hp) | Max Pressure psi (bar) | Air Consumption at Max HP scfm (L/s) | Engagement Type** | Inlet Size (NPT) | Exhaust Size (NPT) | Gas Sealed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **No Lubrication Required** | | | | | | | | | | | |
| 1 to 10 | G | SS100* | E | No | 15 | 150 (10.3) | 415 (196) | Pre-Engaged or Inertia | 1" | 1 1/2" | Yes |
| **Lubrication Required** | | | | | | | | | | | |
| 8 to 27 | G | 150BMG | E | No | 32 | 150 (10.3) | 680 (321) | Inertia | 1 1/4" | 1 1/4" | Yes |
| 8 to 27 | G | 150BMP | E | No | 32 | 150 (10.3) | 680 (321) | Pre-Engaged | 1 1/4" | 1 1/4" | No |
| 15 to 32 | G | 150BMP | D | No | 32 | 150 (10.3) | 680 (321) | Pre-Engaged | 1 1/4" | 1 1/4" | No |
| 8 to 27 | F | SS350G | E | No | 36 | 150 (10.3) | 900 (425) | Pre-Engaged | 1 1/4" | 1 1/2" | Yes |
| 16 to 130 | H | SS810 | B | No | 80 | 150 (10.3) | 1700 (802) | Inertia | 1 1/2" | 2 1/2" | Yes |
| 16 to 130 | H | SS815 | B | No | 80 | 150 (10.3) | 1700 (802) | Pre-Engaged | 1 1/2" | 2 1/2" | Yes |
| 80 to 200 | H | SS825 | C | No | 75 | 150 (10.3) | 1350 (637) | Pre-Engaged | 1 1/2" | 2 1/2" | Yes |
| 160 to 320 | H | SS850 | D | No | 75 | 150 (10.3) | 1275 (602) | Pre-Engaged | 1 1/2" | 2 1/2" | Yes |

These figures are only a guide. For difficult-to-start engines or for operation under adverse conditions, use the next more powerful starter. For 2-stroke diesel engines, these figures may be multiplied by 1.5. Ex: an SS100 could be used on a 15 liter 2-stroke diesel engine. For carbureted (gas) engines, these figures may be doubled. Ex: a 150BMP could be used on a 54 liter gas engine. Note 1 liter = 61.02 $in^3$.

** There are two basic types of air starters: pre-engaged and inertia. With pre-engaged starters, the drive pinion is completely engaged with the engine ring gear before the starter begins to crank the engine. With an inertia starter, the rotating drive pinion engages the engine ring gear simultaneously with the initial cranking of the engine.

*The SS100 is lube-free

## SS100 Series

**For engine displacement of:**
Diesel–0 to 600 CID (0 to 10 liters)
Carbureted–0 to 1200 CID (0 to 20 liters)

## Features/Benefits

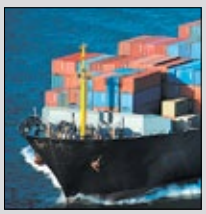
- Powerful, revolutionary lube-free vane motor can be used with air or natural gas
- Alloy steel motor components ensure reliability in harsh conditions
- Offset-gear design for rugged power transfer and easy field service
- Class-leading starting torque for engines up to 10 liters
- One starter replaces the 3BM, 5BM and SS175 series

## Versatile

- One size fits engines up to 10 liters to lower cost and reduce inventory
- Compact design and flexible mounting for easy fit-up
- Standard and metric pinions fit most manufacturers' engines
- Overhung pinion and 360° flange design for easy installation
- Dependable accessories including valves, mufflers and deflectors

### Industry Applications

MARINE



OIL & GAS

OFF-HIGHWAY

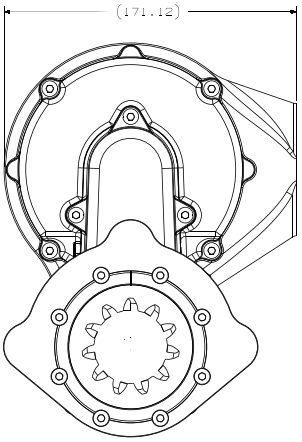
LOCOMOTIVE

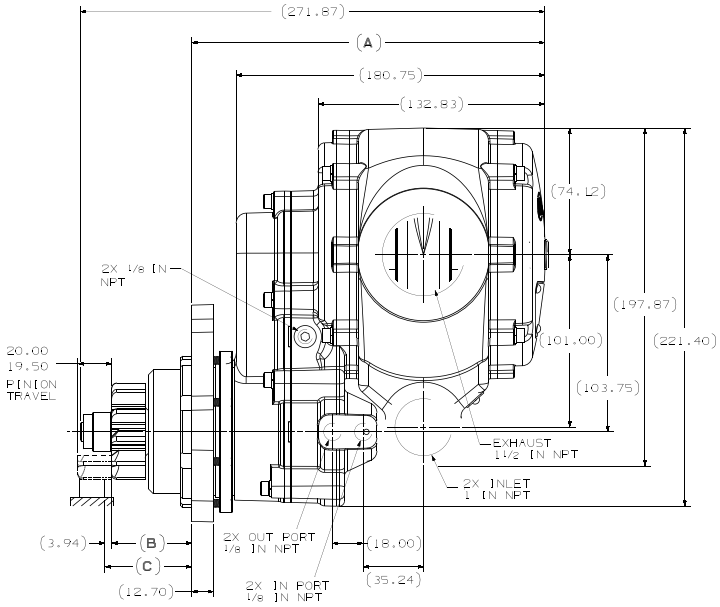
POWER GENERATION

## Dimensions

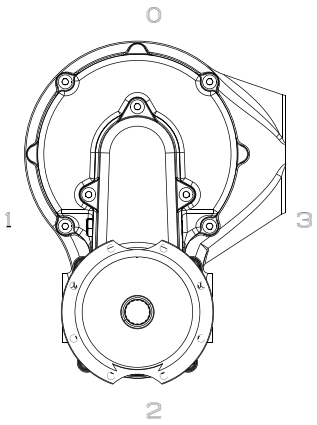
**SS100**
Weight: 28lbs (12.7 kg)

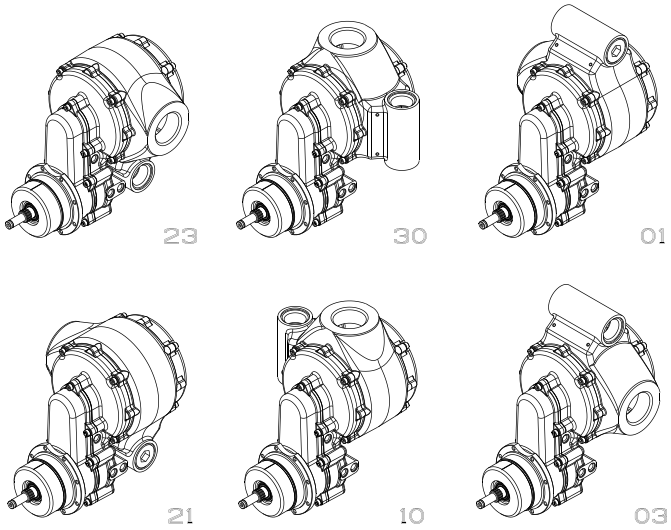
**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




## Housing Orientations




## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **SS100** | | | | |
| 30 (2.1) | 16 (22) | 1290 | 2.3 (1.7) | 110 (52) |
| 60 (4.1) | 39 (53) | 1625 | 6.4 (4.8) | 215 (101) |
| 90 (6.2) | 55 (75) | 1800 | 9.6 (7.2) | 315 (149) |
| 120 (8.3) | 75 (102) | 1900 | 13.8 (10.3) | 415 (196) |
| 150 (10.3) | 75 (102) | 1900 | 13.8 (10.3) | 415 (196) |

## Model Coding

**SS100P 01 R 071-2 3**

- Flange Code
- Pinion Code
- Exhaust Orientation
- Inlet Orientation

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | SRV100 | 1″ Relay Valve |
|  | SRV100-SMB | 1″ Relay Valve with Push Button |
|  | SRV150SS | 1-1/2″ Gas Rated Relay Valve |
|  | SS350-A674 | 1-1/2″ Muffler |
|  | SS350-A735 | Exhaust Deflector |

| | Part # | Description |
|---|---|---|
|  | 150BMP-1051B | 1/4″ 12V Solenoid Valve |
| | 150BMP-2451B | 1/4″ 24V Solenoid Valve |
|  | SMB-618 | Push Button Valve |
|  | SMB-G618 | Push Button Valve for Natural Gas |
|  | ST900-267H/100 | 1″ Strainer Housing |
| | *ST900-267H/150 | 1-1/2″ Strainer Housing |
| | ST900-267H/200 | 2″ Strainer Housing |
|  | ST900-266/100-HP | 1″ Strainer (50 microns) |
| | *ST900-266/150-HP | 1-1/2″ Strainer (50 microns) |
| | *ST900-266/200-HP | 2″ Strainer (50 microns) |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

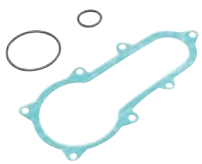
## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| SS100-TK1 | Tune Up Kit |
| SS100-GK1 | Gear Kit |
| SS100-TK2 | Drive Housing Seal Kit |
| SS100-K299 | Drive Kit |
| SS100-K299-18 | Pinion Hardware Kit |
| SS100-K301-01 | Flange Kit, SAE 01 |
| SS100-K301-03 | Flange Kit, SAE 03 |
| SS100-K301-04 | Flange Kit, SAE 04 |
| SS100-K301-GM | Flange Kit, GM |

*SS100-TK1 Parts*

*SS100-GK1 Parts*

*SS100-TK2 Parts*



*SS100-K299 Parts*

*SS100-K299-18 Parts*

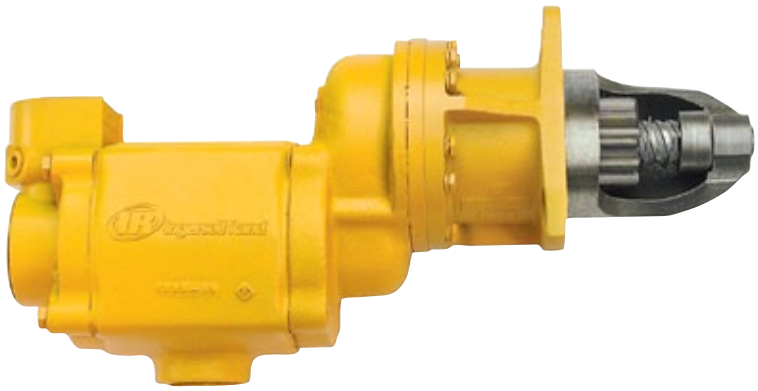
*SS100-K301-01 Parts*

*SS100-K301-03 Parts*

*SS100-K301-GM Parts*

*4 Parts*

## 150BM Series



**For engine displacement of:**
Diesel–500 to 2000 CID (8 to 32 liters)
Carbureted–1000 to 4000
CID (16 to 64 liters)

## Features/Benefits

- Powerful 32 hp motor
- The leading mid-range starter design, the standard by which all others are measured
- Simple design ensures rugged dependability and ease of maintenance
- Multiple offset gear ratios: E = 3.46:1; D = 3.94:1
- Backcap ports for injection lubricating

## Versatile

- 150BMG sealed for use in air or gas applications
- Offset design for simple mounting
- Inertia and pre-engaged starters available
- 4 inlet, 4 exhaust, and 18 drive housing orientations
- 90-150 psi (6.2-10.3 bars) operation
- Left- and right-hand rotation available

## Industry Applications

MARINE

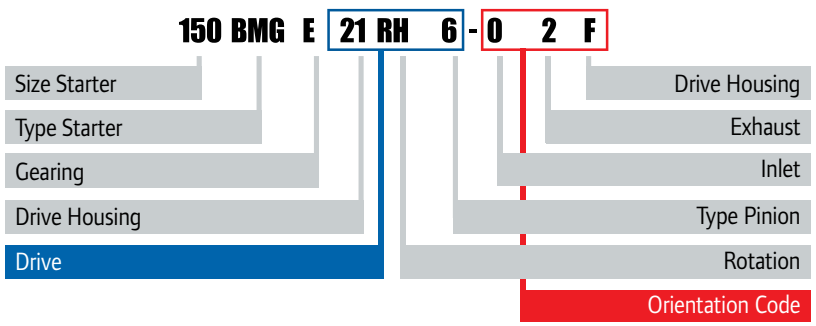
OIL & GAS

OFF-HIGHWAY

TRANSPORTATION

POWER GENERATION

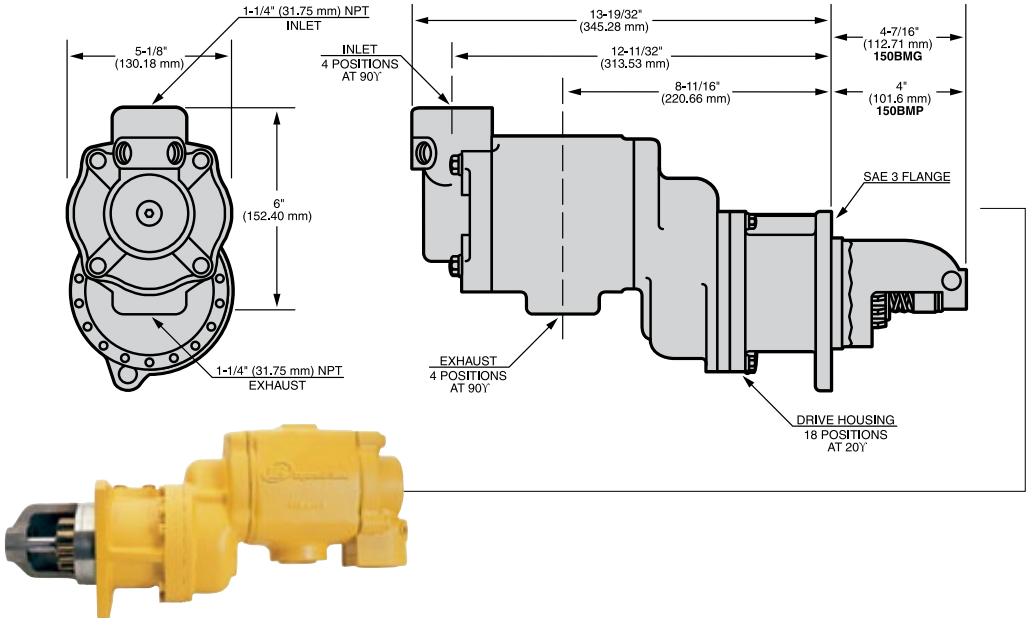
## Model Coding



## Dimensions

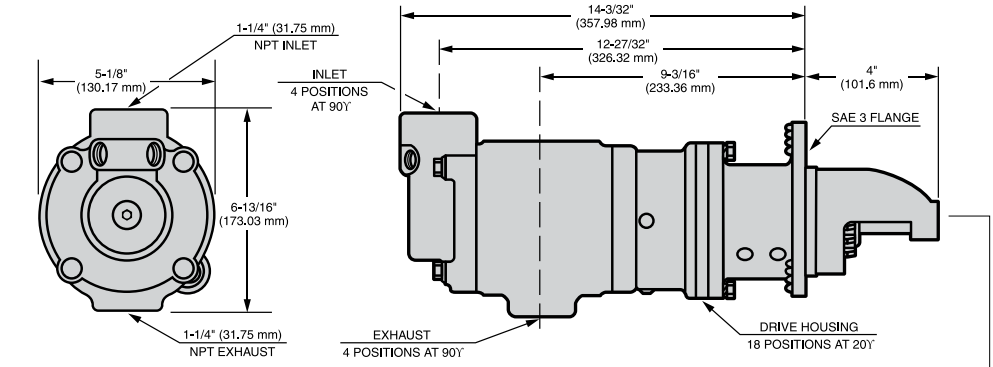
**150BMG/150BMP**
Weight:
150BMG 38 lbs (17.2 kg)
150BMP 40 lbs (18.1kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.






**150BMPD**
Weight: 40 lbs (15.9 kg)



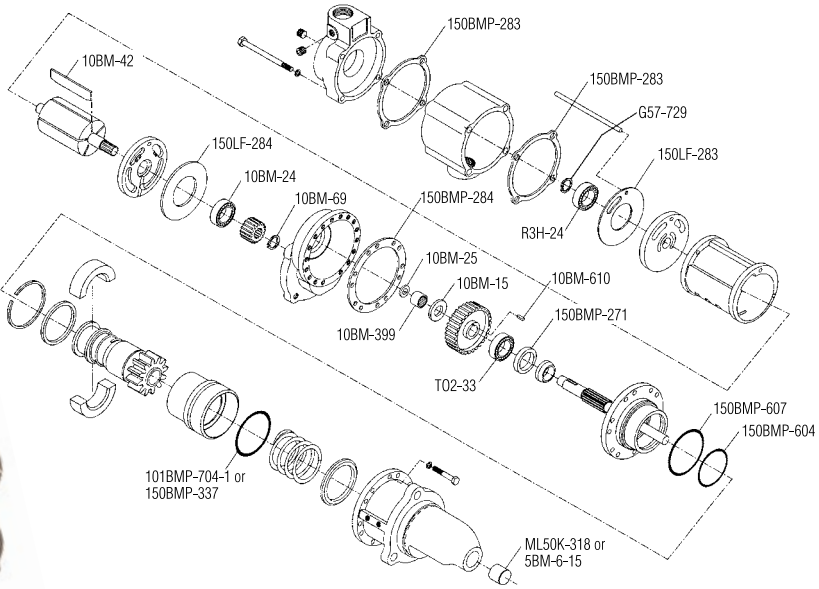

## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **150BMGE/150BMPE** | | | | |
| 90 (6.2) | 100 (136) | 1700 | 16 (12) | 380 (179) |
| 120 (8.3) | 130 (176) | 1900 | 24 (18) | 500 (236) |
| 150 (10.3) | 155 (210) | 2200 | 32 (24) | 680 (321) |
| **150BMPD** | | | | |
| 90 (6.2) | 110 (149) | 1500 | 16 (12) | 370 (175) |
| 120 (8.3) | 145 (196) | 1700 | 24 (18) | 500 (236) |
| 150 (10.3) | 175 (237) | 1900 | 32 (24) | 650 (307) |

# Vane Starters

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| 150BM-TK2 | 150BM Products |
| 150LF-TK2 | 150LF Products (uses 150LF-42 vanes) |
| 150LF-TK1 | 150 Motor Gasket Kit for all vane motor 150 products |
| 150BMPD-TK1 | 150BMPD Products |




*Exploded View of 150BM-TK2 Part Location*

## Parts

*150LF-TK1 Parts*

*150BM-TK2 Parts*

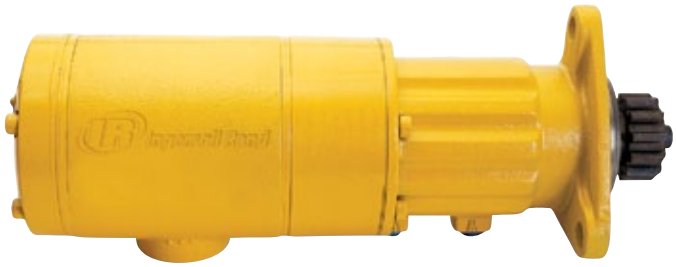
## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | 150BM-A674 | 1 1/4" Muffler |
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | NL-24-8 | In-Line Lubricator |
|  | HDL2 (Stationary) | 3/8" NPT Lubricator (1.3 cc) |
| | HDL3 (Transportation) | 3/8" NPT Lubricator (0.4 cc) |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |

| | Part # | Description |
|---|---|---|
|  | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | SRV125T | 1-1/4" Relay Valve for Vehicular Applications |
| | SRV125 | 1-1/4" Relay Valve for Stationary Applications |
|  | 150BMP-1058 | Gladhand |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
| | ST900-267H/200 | 2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2'' Strainer (50 microns) |
| | ST900-266/200-HP | 2'' strainer (50 microns) |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | 150BM-A735 | Road Splash Deflector |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

## SS350 Series



GENUINE OEM APPROVED

**For engine displacement of:**
Diesel–200 to 1200 CID (3 to 20 liters)
Carbureted–400 to 2400 CID (6 to 40 liters)

## Features/Benefits

- Rugged 36 hp motor on SS350
- Overhung pre-engaged pinion design for fit-up flexibility
- Backcap ports for injection lubricating

## Versatile

- Sealed for use in air or gas applications
- Compact, lightweight design makes installation easier
- Left- or right-hand rotation available
- 4 inlet, 4 exhaust, and 12 housing orientations
- 30-150 psi (2.1-10.3 bars) operation
- SAE 01 and SAE03 mounting flanges fit most worldwide manufacturers' engines

### Industry Applications

MARINE

OIL & GAS

OFF-HIGHWAY

TRANSPORTATION

POWER GENERATION

### Model Coding

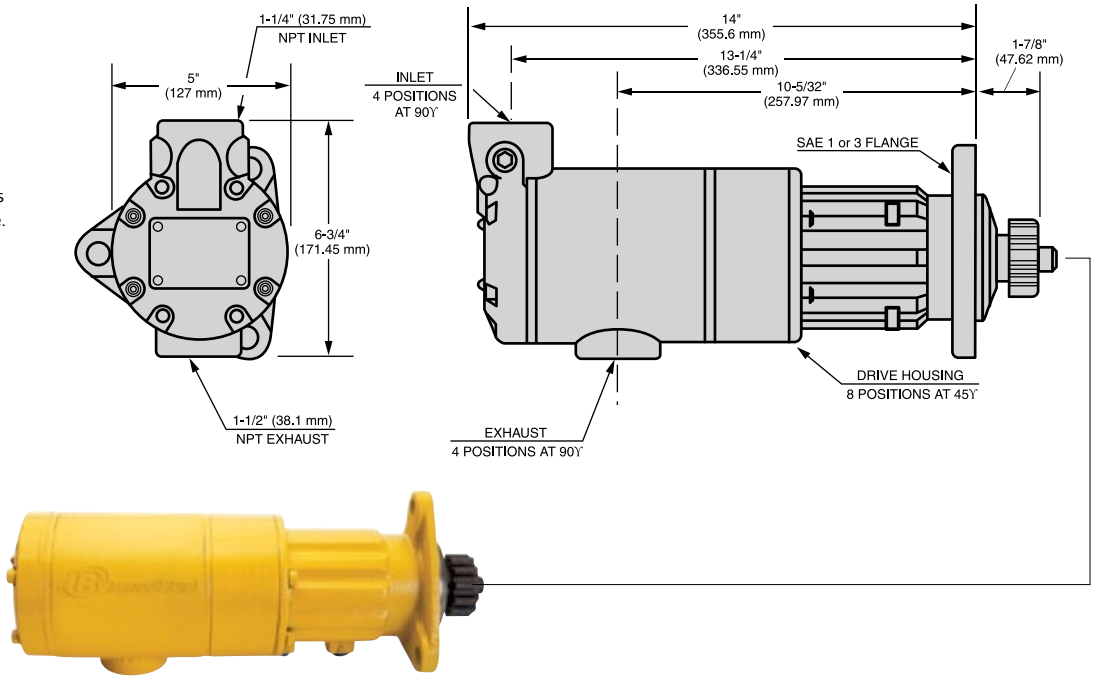
**SS350 G E 03 R 31 XX - 024**

- Size Starter
- Gas Sealed
- Gear Ratio
- SAE No. Mounting Flange
- Rotation L or R
- Pinion Coding
- SR = Spark Resistant
- Orientation

## Dimensions

**SS350G**
Weight: 33 lbs (15.0 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.






## Performance Information

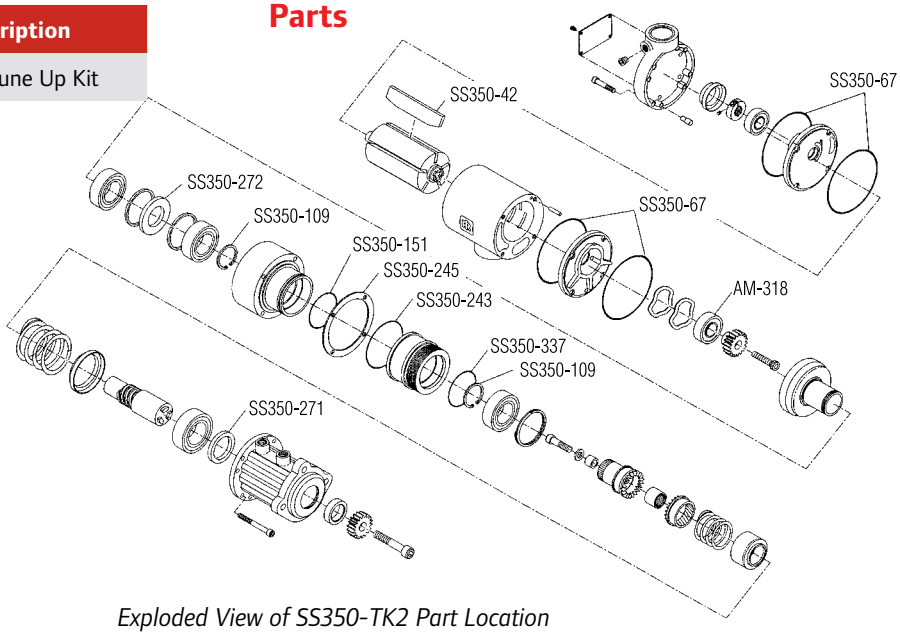
| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | | Speed @ Max HP rpm | | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|---|---|
| **SS350** | **B Ratio** | **E Ratio** | **B Ratio** | **E Ratio** | | |
| 90 (6.2) | 70 (95) | 100 (136) | 2900 | 2000 | 19 (14) | 525 (248) |
| 120 (8.3) | 90 (122) | 130 (176) | 3100 | 2200 | 27 (20) | 750 (354) |
| 150 (10.3) | 110 (149) | 160 (217) | 3400 | 2400 | 36 (27) | 900 (425) |

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| SS350-TK2 | SS350 Tune Up Kit |

*SS350-TK2 Parts*

## Parts




*Exploded View of SS350-TK2 Part Location*

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | SS350-A674 | 1 1/2" Muffler |
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | NL-24-8 | In-Line Lubricator |
|  | HDL2 (Stationary) | 3/8" NPT Lubricator (1.3 cc) |
| | HDL3 (Transportation) | 3/8" NPT Lubricator (0.4 cc) |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |

| | Part # | Description |
|---|---|---|
|  | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | SRV125T | 1-1/4" Relay Valve for Vehicular Applications |
| | SRV125 | 1-1/4" Relay Valve for Stationary Applications |
|  | 150BMP-1058 | Gladhand |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
| | ST900-267H/200 | 2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
| | ST900-266/200-HP | 2" Strainer (50 microns) |
|  | 150BMP-1056 | 1/2" Check Valve |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

## SS800 Series

GENUINE OEM APPROVED

**For engine displacement of:**
Diesel–1000 to 20,000 CID (16 to 320 liters)
Carbureted–2000 to 40,000
CID (32 to 640 liters)

## Features/Benefits

- Powerful 75 hp motor
- The leading large-frame starter design, the standard by which all others are measured
- Simple design ensures rugged dependability and ease of maintenance
- Multiple offset gear ratios: B = 2.18:1; C = 2.53:1; D = 3.44:1
- Backcap ports for injection lubricating

## Versatile

- All models sealed for use in air or gas applications
- Offset design for simple mounting
- Inertia (SS810) and pre-engaged (SS815, SS825 and SS850) starters available
- 4 inlet, 4 exhaust, and 16 drive housing orientations
- 90-150 psi (6.2-10.3 bars) operation
- Left- and right-hand rotation available

## Industry Applications

MARINE

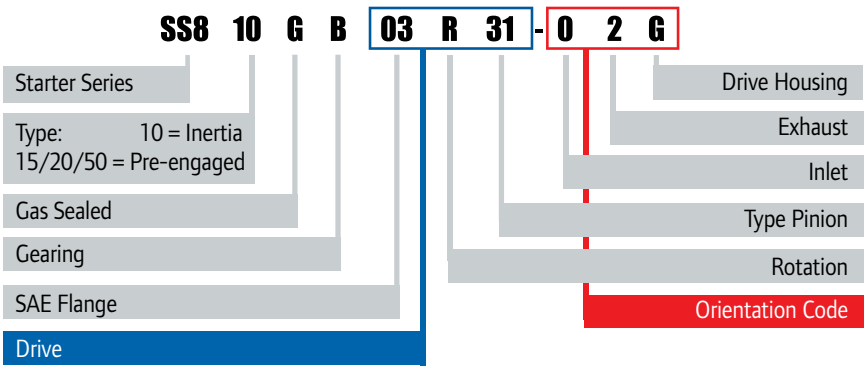
OIL & GAS

OFF-HIGHWAY

TRANSPORTATION

POWER GENERATION

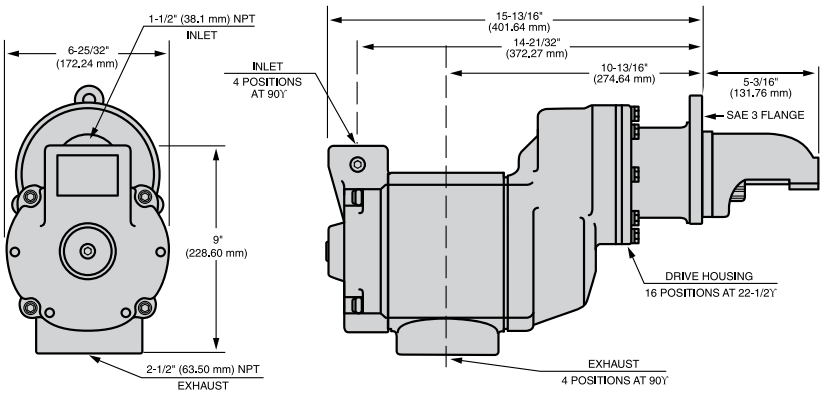
## Model Coding



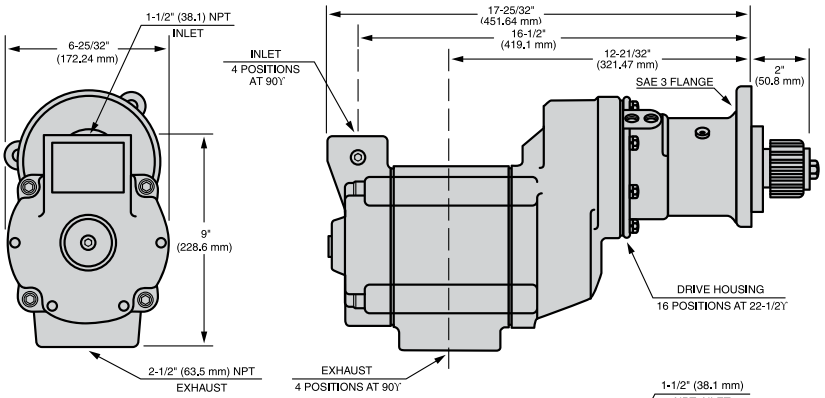
## Dimensions

**Note:** All dimensions shown are for reference only.
Specifications subject to change without notice.

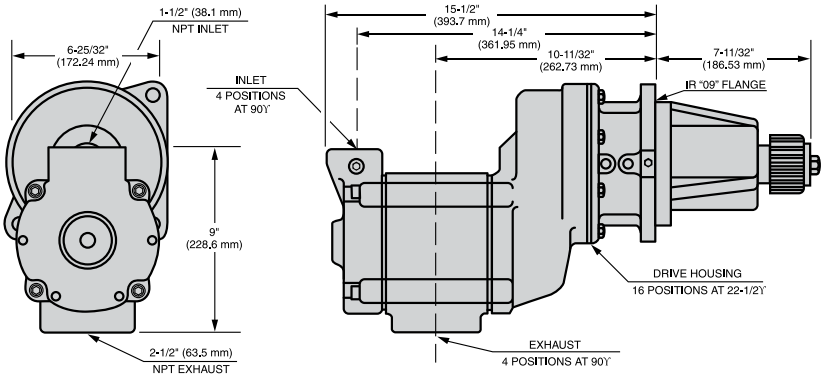
**SS810G**
Weight: 93 lbs (42.2 kg)




**SS815G and SS825G**
Weight: SS815G 93 lbs (31.3 kg)
SS825G 95 lbs (43.1 kg)




**SS850G**
Weight: 123 lbs (55.8 kg)




## Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **SS810 and SS815** | | | | |
| 90 (6.2) | 170 (230) | 2700 | 45 (34) | 1100 (519) |
| 120 (8.3) | 205 (278) | 2800 | 58 (43) | 1250 (590) |
| 150 (10.3) | 250 (339) | 3200 | 75 (56) | 1700 (802) |
| **SS825** | | | | |
| 90 (6.2) | 200 (271) | 2300 | 45 (34) | 900 (425) |
| 120 (8.3) | 240 (325) | 2400 | 58 (43) | 1100 (519) |
| 150 (10.3) | 300 (407) | 2700 | 75(56) | 1700 (802) |
| **SS850** | | | | |
| 90 (6.2) | 260 (352) | 1600 | 45 (34) | 800 (378) |
| 120 (8.3) | 340 (461) | 1800 | 58 (43) | 1000 (472) |
| 150 (10.3) | 415 (562) | 1900 | 75(56) | 1275 (602) |

# Vane Starters

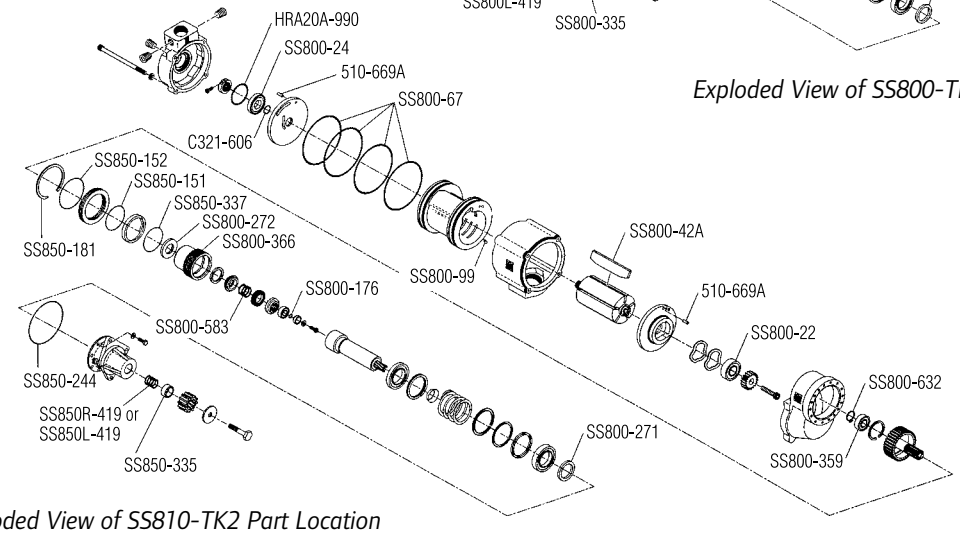
## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| SS800-TK2 | SS815 and SS825 Tune Up Kit |
| SS810-TK2 | SS810 Tune Up Kit |
| SS810-TK2 | SS850 Tune Up Kit |

*SS800-TK2 Parts*




*Exploded View of SS800-TK2 Part Location*




*Exploded View of SS810-TK2 Part Location*

*SS810-TK2 Parts*

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | SS800-A674 | 2-1/2" Muffler |
|  | 150BMP-1051B | 1/4" 12 V Solenoid Valve |
| | 150BMP-2451B | 1/4" 24 V Solenoid Valve |
|  | NL-24-8 | In-Line Lubricator |
|  | HDL2 (Stationary) | 3/8" NPT Lubricator (1.3 cc) |
| | HDL3 (Transportation) | 3/8" NPT Lubricator (0.4 cc) |
|  | SMB-G618 | Gas Rated Push Button Valve |
|  | SMB-618 | Push Button Valve |

| | Part # | Description |
|---|---|---|
|  | SRV150 | 1-1/2" Relay Valve for Air Applications |
|  | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | 150BMP-1058 | Gladhand |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
| | ST900-267H/200 | 2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
| | ST900-266/200-HP | 2" strainer (50 microns) |

please order ref ST900-267/150-HP

# TS700/TS900/TS1400 Series

## Starters for Gas Turbine Engines

GENUINE OEM APPROVED

## Features/Benefits

- Powerful turbine motors up to 146 HP require no external lubrication
- Sealed oil-bath system internally lubricates the planetary gears and motor bearings
- Air cooling extends bearing and seal life
- No internal or external shut-off devices

## Versatile

- Multiple spline pinions
- Multiple gear ratios for matching the optimum engine characteristics
- Multiple flange options
- Gas-sealed for application flexibility

## Industry Applications

MARINE

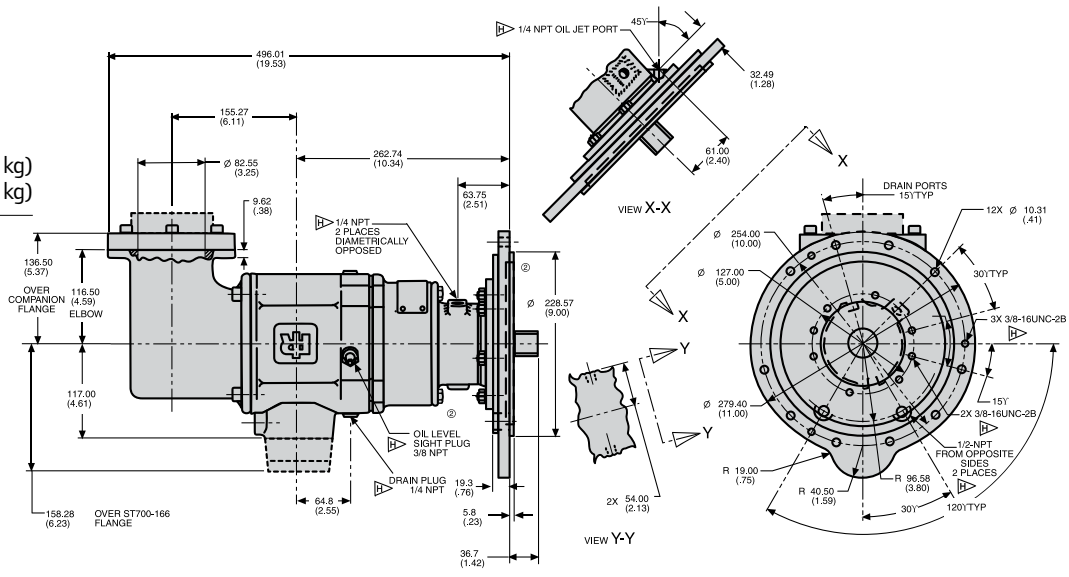
POWER GENERATION

## Dimensions

**TS725/TS750GBBE-LE**

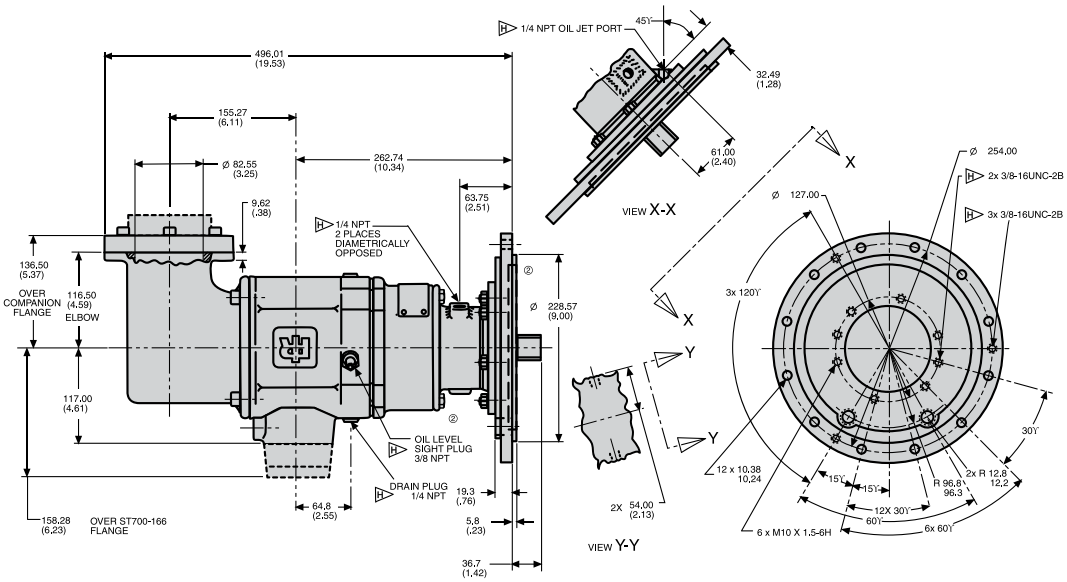
Weight:
TS725GBBE-LE 80 lbs (36.3 kg)
TS750GBBE-LE 80 lbs (36.3 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



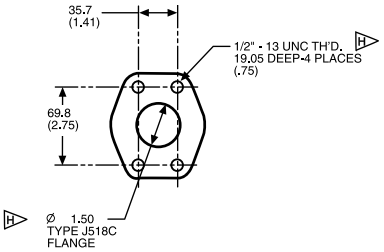
## Dimensions

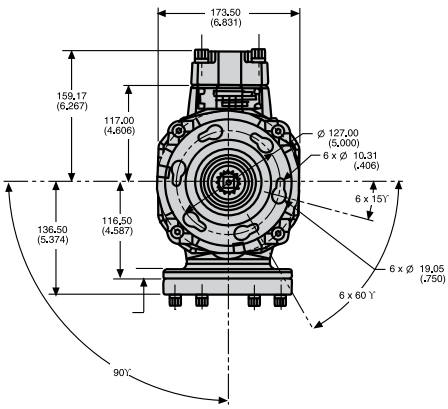
**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



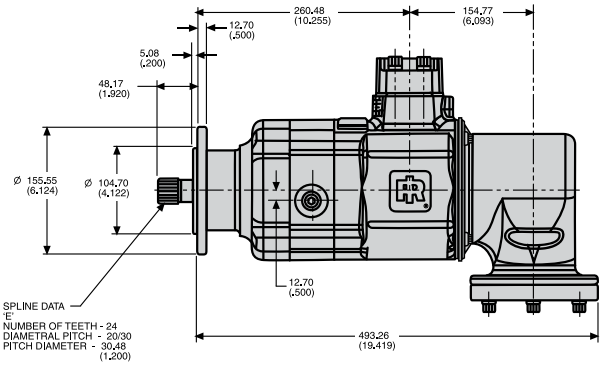

**TS725GBDE-LE**
Weight: 80 lbs (36.3 kg)

**Inlet Flange Kit (ST700-K166)**

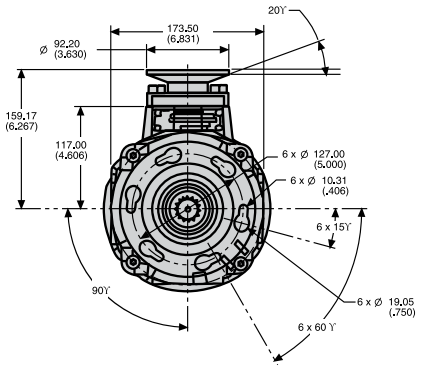


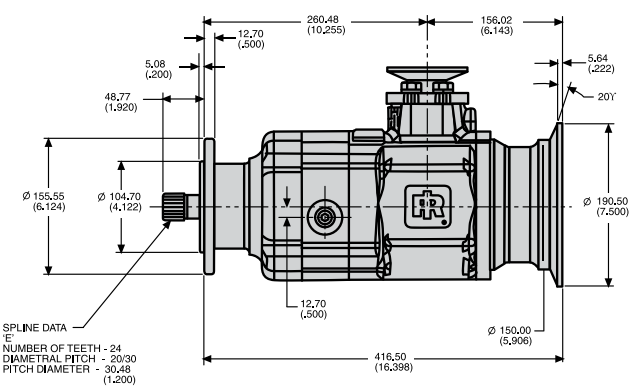




**TS799BBEF-LE**
Weight: 70 lbs (31.8 kg)




**TS799BBEF-LM**
Weight: 62 lbs (28.1 kg)

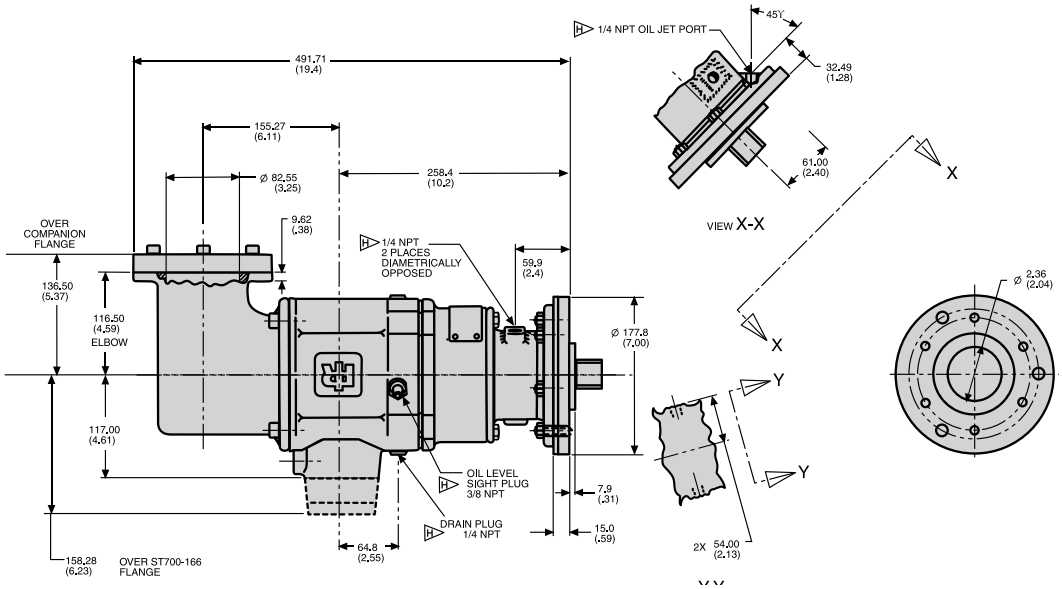


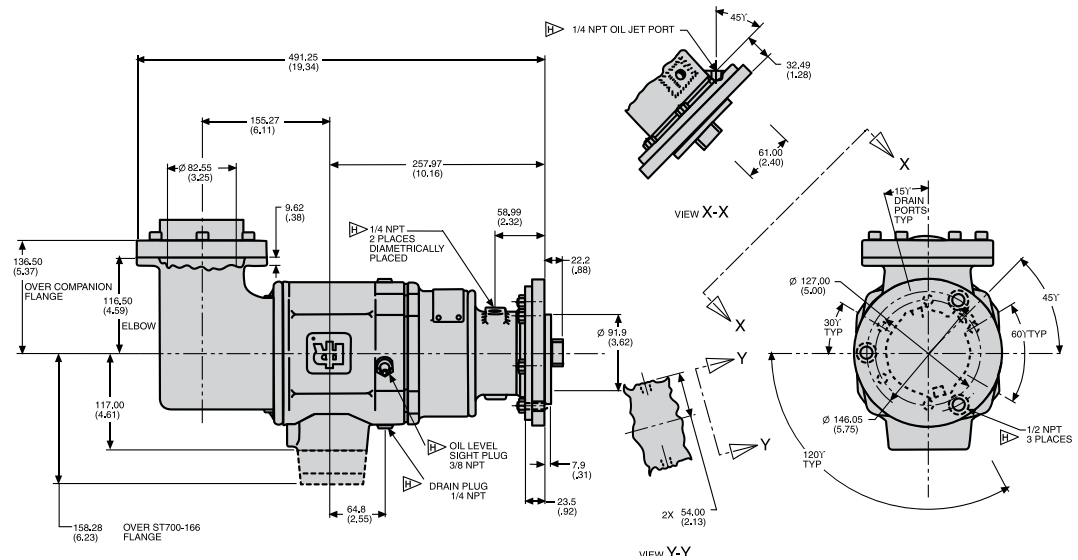
## Dimensions

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.

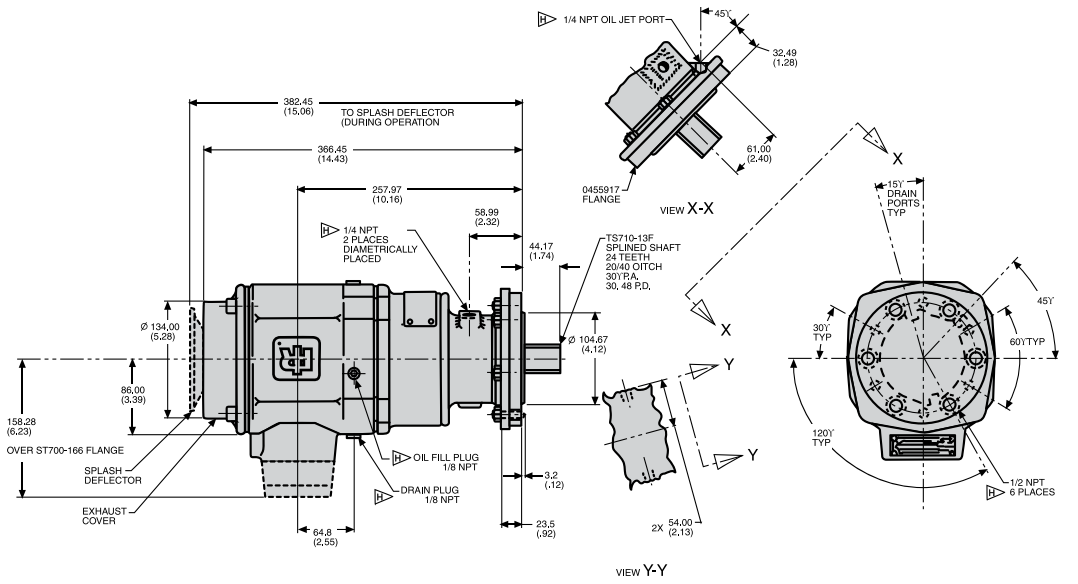
**TS799GBFD-L**
Weight: 70 lbs (31.8 kg)




**TS999GZCD-LE**
Weight: 70 lbs (31.8 kg)




**TS999GZFA-L**
Weight: 58 lbs (26.3 kg)

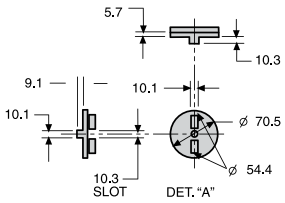


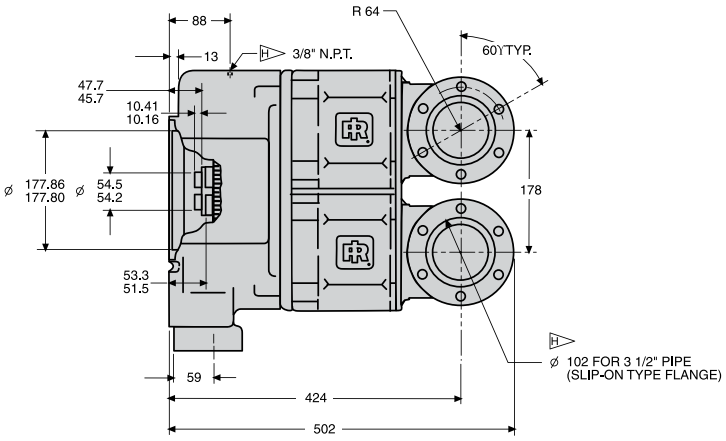
# Vane Starters

## Dimensions

**Note:** All dimensions shown a
for reference only. Specificatio
subject to change without noti

**TS1400 Turbine Units**
Weight: 124 lbs (56.2 kg)




## Single Motor Performance Information

| Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) |
|---|---|---|---|---|
| **TS725** | | | | |
| 90 (6.2) | 110 (149) | 2000 | 18 (13) | 330 (156) |
| 150 (10.3) | 180 (243) | 2300 | 40 (30) | 515 (243) |
| 225 (15.5) | 270 (365) | 2500 | 65 (49) | 750 (354) |
| **TS750** | | | | |
| 90 (6.2) | 170 (230) | 2200 | 30 (22) | 850 (401) |
| 120 (8.3) | 240 (325) | 2300 | 50 (37) | 990 (467) |
| 150 (10.3) | 300 (407) | 2500 | 70 (52) | 1210 (571) |
| **TS799G** | | | | |
| 60 (4.1) | 250 (339) | 2400 | 55 (41) | 1050 (496) |
| 90 (6.2) | 310 (420) | 2500 | 70 (52) | 1400 (661) |
| **TS799B** | | | | |
| 150 (10.3) | 570 (773) | 2500 | 130 (97) | 2200 (1038) |
| **TS999** | | | | |
| 90 (6.2) | 125 (169) | 5500 | 71 (53) | 1300 (614) |

## Dual Motor Performance Information

| Part Number | Solar Part Number | Max Pressure psi (bar) | Breakaway Torque ft-lb (Nm) | Speed @ Max HP rpm | Max Power hp (kW) | Flow @ Max HP scfm (L/s) | Motor Arc |
|---|---|---|---|---|---|---|---|
| **TS1400** | | | | | | | |
| TS1401-102 | 190475-102 | 225 (15.5) | 420 (567) | 3100 | 124 (93) | 1700 (802) | 25% |
| TS1435 | 190475-301 | 225 (15.5) | 459 (620) | 3882 | 141 (105) | 1900 (896) | 35% |
| TS1450 | 190475-401 | 150 (10.3) | 506 (683) | 3034 | 146 (109) | 2500 (1179) | 50% |

## TS Engine Selection Guide

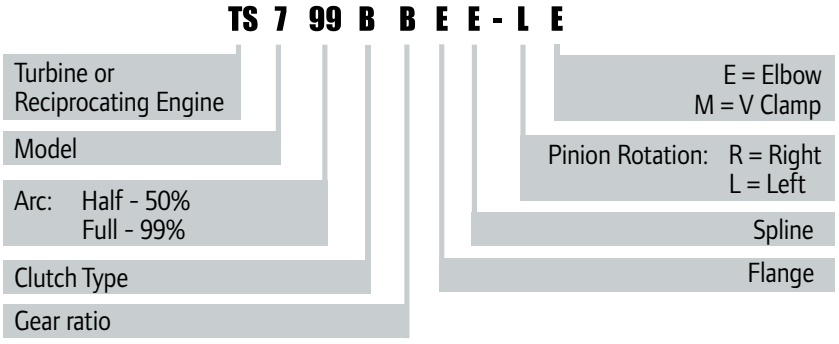
| Engine | Part Number | Solar Part Number | Max Pressure psi (bar) |
|---|---|---|---|
| **Solar Saturn** | TS725GBBE-LE | 190716-200 | 225 (15.5) |
| | TS725GBDE-LE | 190716-100 | 225 (15.5) |
| | TS750GBBE-LE | - | 150 (10.3) |
| **Solar Centaur** | TS1435 | 190475-301 | 225 (15.5) |
| | TS1450 | 190475-401 | 180 (12.2) |
| | TS1401-102 | 190475-102 | 225 (15.5) |
| **Solar Taurus** | TS1435 | 190475-301 | 225 (15.5) |
| | TS1450 | 190475-401 | 180 (12.2) |
| | TS1401-102 | 190475-102 | 225 (15.5) |
| **Allison 570** | TS799GBFD-L | - | 90 (6.2) |
| **Allison 501-KC** | TS999GZFA-L | - | 90 (6.2) |
| **Allison 501-KB** | TS999GZFA-L | - | 90 (6.2) |
| **Garret IE831** | TS999GZCD-LE | - | 90 (6.2) |
| **Pratt & Whitney GG3/F13, GG4/G14** | TS799BBEF-LE | - | 150 (10.3) |
| | TS799BBEF-LM | - | 150 (10.3) |

This chart is a condensed list of engines that can be cranked with a starter. For a complete list, please contact Ingersoll Rand.

## TS700/TS900 Output Spline Data

| TS Part Number | Shaft Output Part Number | Teeth | Diametral Pitch | Pressure Angle | Pitch Diameter |
|---|---|---|---|---|---|
| **TS725GBBE-LE** | TS710-13E | 24 | 20/30 | 30 | 30.48 |
| **TS725GBDE-LE** | TS710-13E | 24 | 20/30 | 30 | 30.48 |
| **TS750GBBE-LE** | TS710-13E | 24 | 20/30 | 30 | 30.48 |
| **TS799BBEF-LE** | TS799-18E | 24 | 20/30 | 30 | 30.48 |
| **TS799BBEF-LM** | TS799-18E | 24 | 20/30 | 30 | 30.48 |
| **TS799GBFD-L** | 4612834 | 16 | 20/30 | 30 | 20.32 |
| **TS999GZCD-LE** | 4612834 | 16 | 20/30 | 30 | 20.32 |
| **TS999GZFA-L** | TS710A-13F | 24 | 20/40 | 30 | 30.48 |

## Model Coding



# Vane Starters

## Parts and Accessories

| | Part # | Description |
|---|---|---|
|  | SRV150 | 1-1/2" Relay Valve for Air Applications |
|  | SRV150SS | 1-1/2" Gas Rated Relay Valve |
|  | 150BMP-1064 | 1/8", 150 psi Pressure Gauge |

| | Part # | Description |
|---|---|---|
|  | *ST900-267H/150 | 1-1/2" Strainer Housing |
| | ST900-267H/200 | 2" Strainer Housing |
|  | *ST900-266/150-HP | 1-1/2" Strainer (50 microns) |
| | ST900-266/200-HP | 2" Strainer (50 microns) |

*For complete filter (strainer + housing), please order ref ST900-267/150-HP

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| **TS1400** | |
| TS1400-TK1 | Seal and O-Ring Kit |
| TS1401-RM1 | Seals, Bearings, and 2-25% Arc Motors |
| TS1401-RM2 | Seals, Bearings, and 2-99% Arc Motors |
| TS1401-RM3 | Seals, Bearings, and 2-35% Arc Motors |
| TS1401-RM4 | Seals, Bearings, and 2-50% Arc Motors |
| TS1401-TK1 | Seal and O-Ring Kit |

| Tune Up Kit Part Number | Description |
|---|---|
| **TS700** | |
| TS700-RM1 | Bearing and O-Ring Kit (includes TS700-TK1) |
| TS700-TK1 | O-Ring Kit |

# Versatile Starting Performance

*Barring Motors*

GENUINE OEM APPROVED

**For engine displacement of:**
Diesel–up to 30,500 CID (500 liters) Carbureted–up to 61,000 CID (1000 liters)

## Features/Benefits

- Reversible vane air motor for precise control
- Rugged design provides maximum durability and dependability
- Pendant control enables safer one-person operation
- B006 for diesel engines with displacements up to 100 liters and gas engines up to 200 liters
- T480 for diesel engines with displacements up to 500 liters and gas engines up to 1000 liters
- Integral disc brake on T480 is always engaged when motor is not in operation to ensure safer, easier engine adjustments

## Versatile

- Available in two sizes
- Turns clockwise and counterclockwise at full power
- Can be used as a portable service tool or be permanently mounted to the engine
- Uses standard motor and pinion components
- Adjustable mounting flange allows multiple orientations

# Barring Motors

## Performance Information

| Model | Flange | Weight lb (kg) | Max Pressure (motor inlet) psi (bar) | Breakaway Torque ft-lb (Nm) | Speed at Max Power rpm | Description |
|---|---|---|---|---|---|---|
| **B006** | | | | | | |
| B006PVR374-01** | 01 | 19 (9) | 90 (6) | 152 (207) | 23 | Barring Motor Only |
| B006PVR374-03** | 03 | 19 (9) | 90 (6) | 152 (207) | 23 | Barring Motor Only |
| B006PVR374-01-**P | 01 | 25 (11) | 90 (6) | 152 (207) | 23 | Barring Motor with Pendant Control |
| B006PVR374-03-**P | 03 | 25 (11) | 90 (6) | 152 (207) | 23 | Barring Motor with Pendant Control |
| **Pinion configurations: 15, 29, 31, 77, 79, 85, 94, 893, 895, 942. Additional flange and pinion configurations available upon request. | | | | | | |
| **T480 : Includes integral brake** | | | | | | |
| T480PVRP-03** | 03 | 58 (26) | 90 (6) | 322 (438) | 65 | Barring Motor Only |
| T480PVRP-03-**P | 03 | 58 (26) | 90 (6) | 322 (438) | 65 | Barring Motor with Pendant Control |
| **Pinion configurations: 25, 29, 31, 83, 85, 87, 94, 893, 895, 942. Additional flange and pinion configurations available upon request. | | | | | | |

## Parts and Accessories

| Part # | Description |
|---|---|
| PB006-15K | B006 Pendant Control & 2 Hoses (15′/4.6m each) |
| PB006-30K | B006 Pendant Control & 2 Hoses (30′/9m each) |
| 43551-2 | Muffler for B006 |
| PT480-15K | T480 Pendant Control & 3 Hoses (15′/4.6m each) |
| PT480-30K | T480 Pendant Control & 3 Hoses (30′/9m each) |
| 3BM-A674 | Muffler for T480 |

*A B006PVR374-03-31P barring motor using pendant control, slow turning a Caterpillar 3408 engine.*

# Start with the Best

*Accessories*

## Accessories Index By Description

# Relay Valves

Ingersoll Rand relay valves provide immediate response to assure air starter disengagement and prevent damage to the pinion or flywheel ring gear. The aluminum die cast housing resists abrasion and corrosion while the stainless steel piston return spring will not rust from moisture in the air line.

*SRV150*

*SRV150SS*

*SRV125F-P*

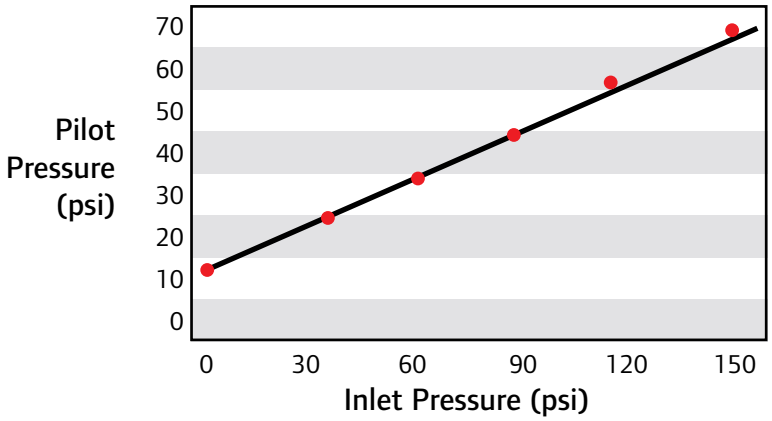
## Specifications

- Maximum Operating Pressure = 225 psi (15.5 bar)
- Operating Temperature Range = -20 to 250˚F (-29 to 121˚C)
- Flow/Pressure Drop $C_v$ = 37

## Relay Valves

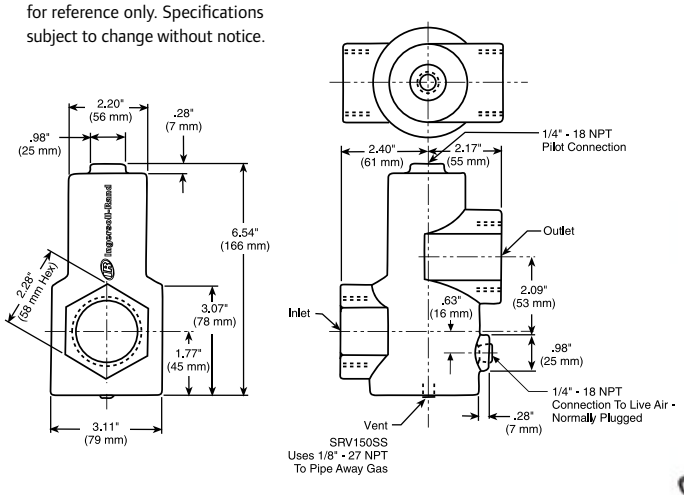
| Part Number | NPT Size Inlet – Outlet | Weight lb (kg) | Description |
|---|---|---|---|
| SRV100 | 1" – 1" | 3.10 (1.41) | 3BMG, 5BMG, SS175G Relay Valve |
| SRV125 | 1-¼" – 1 ¼" | 2.90 (1.32) | 150BM, SS350G, 150T Relay Valve |
| SRV125T | 1-¼" – 1 ¼" | 2.90 (1.32) | 150BM, SS350G, 150T Relay Valve for Transportation |
| SRV150 | 1½" – 1½" | 2.70 (1.22) | SS800, ST700, ST900, ST600 Relay Valve |
| SRV150SS | 1½" – 1½" | 7.15 (3.24) | SS800, ST700, ST900 Relay Valve for Natural Gas Use |
| SRV125F-P | 1-¼" Flanged | 7.40 (3.36) | 150T/150BM 150T/150BM Flange Mount Relay Valve |

## Inlet Pressure vs. Pilot Pressure to Open

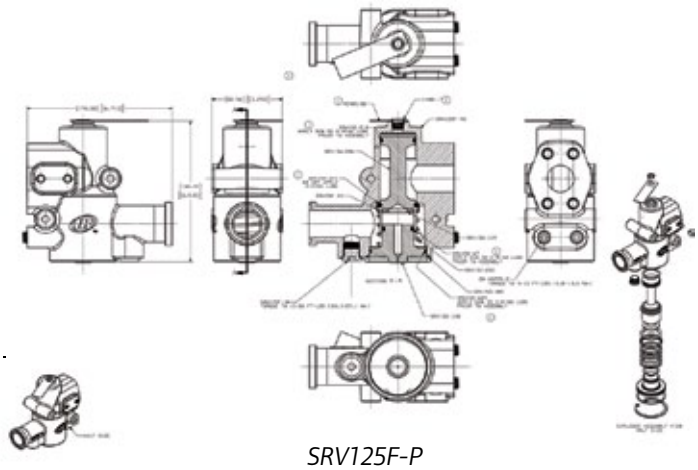


## Dimensions

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




*SRV150*

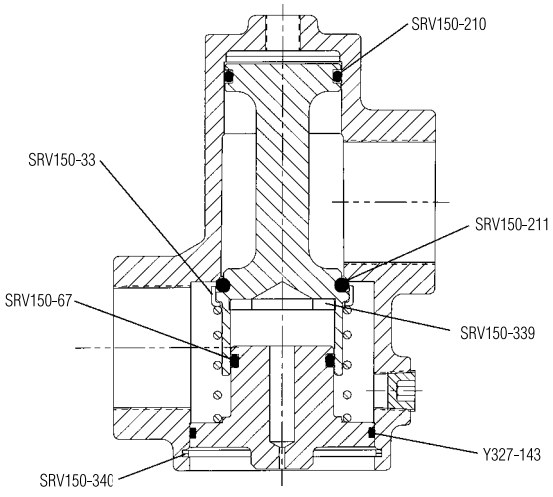


*SRV125F-P*

## Genuine Ingersoll Rand Replacement Kits

| Tune Up Kit Part Number | Description |
|---|---|
| SRV150-TK3 | For use with SRV100, SRV125, SRV125T, SRV150, and SRV150SS Relay Valves |

## Parts




*Cross-Section of SRV150-TK3 Part Location*

*SRV-TK3 Parts*

# Solenoid Control Valves

These DC electrically actuated valves are designed for pilot operation of the Ingersoll Rand relay valve and are approved for applications affected by the U.S. Department of Transportation safety codes.

*150BMP-2451B*

## Specifications

- Valve Type: Three-way normally closed $C_v$ Factor: 0.21
- Power Consumption: 25 watts
- Operating Pressure Range: 0 to 300 psig (0 to 20.7 bar)
- Proof Pressure: 375 psig (25.9 bar)
- Burst Pressure: 1250 psig (86.2 bar)
- Media: Air, Inert gases, water, light oils
- Media Temperature: -4 to 392°F (-20° to 200°C)
- Ambient Temperature: -4 to 248°F (-20° to 120°C)
- Seal Material: Viton

## 150BMP Solenoid Control Valves

| Part Number | Thread Size Inlet – Outlet | Voltage (DC) | Weight lb (kg) | Description |
|---|---|---|---|---|
| 150BMP-1051B* | ¼" – ¼" | 12 volt | 1.95 (.88) | 24" (61 cm) Long Wire Leads |
| 150BMP-2451B* | ¼" – ¼" | 24 volt | 1.95 (.88) | 24" (61 cm) Long Wire Leads |
| 150BMP-6451* | ¼" – ¼" | 64 volt | 1.95 (.88) | 24" (61 cm) Long Wire Leads |
| 150BMP-A1051C* | ¼" – ¼" | 12 volt | 1.95 (.88) | Pioneer Connector Lead |

** Can be mounted on 150BMP-B2451 elbow bracket.*

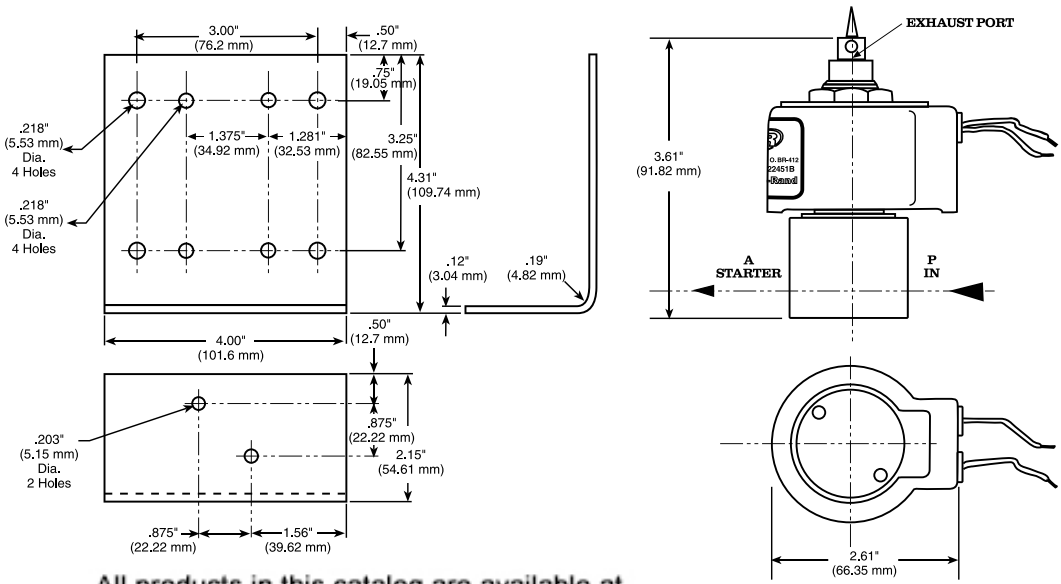
## Dimensions

*Solenoid Control Valve & Bracket*

**150BMP-B2451**
**Mounting Bracket**

Weight: .39 lbs (.17 kg)

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



## Specifications

- Rated Operating Pressure: 150 psig
- Rated Operating Voltage: 12-24 VDC
- Rated Current Draw: 750 mA

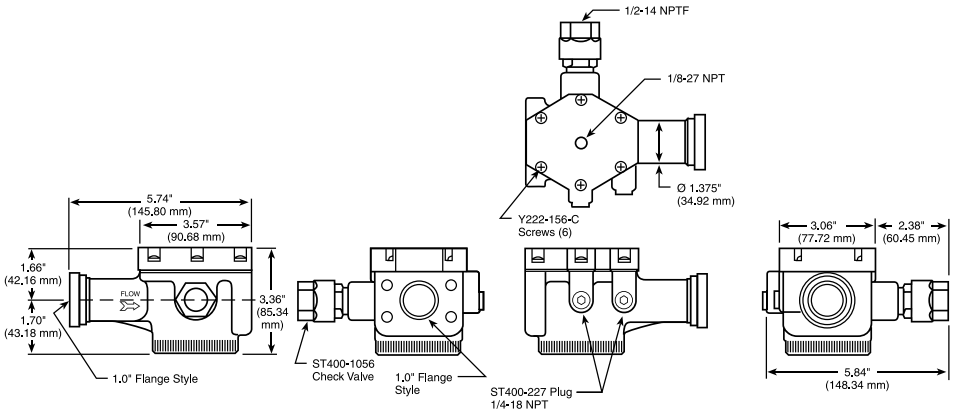
## ST400 Solenoid Control Valves

| Part Number | Inlet – Outlet | Weight lb (kg) | Description |
|---|---|---|---|
| ST400-A339M | 1" – 1" Flange Style | 4.5 (2.04) | Manual Control Valve; must be coupled to Solenoid or Push Button Valve |
| ST400-C339 | 1" – 1" Flange Style | 2.96 (1.34) | Relay Valve with Top Mounted Solenoid Valve |
| ST400-K619 | N/A | .30 (.13) | ST400-A339M Repair Kit |

## Dimensions

### ST400-A339M

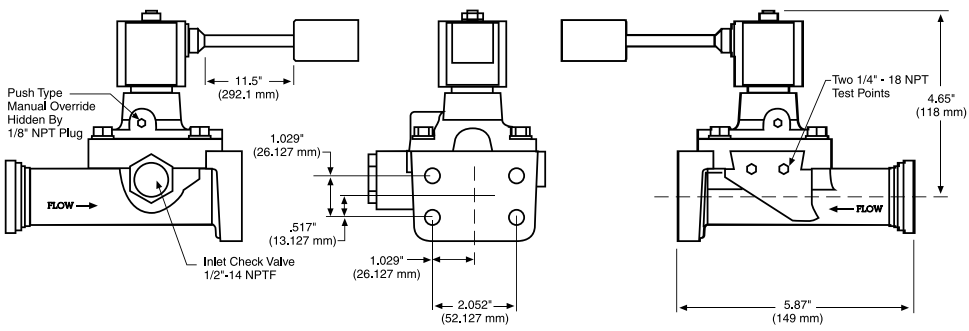
**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




## Dimensions

### ST400-C339

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



# Push Button Control Valves

The Ingersoll Rand manually actuated push button control valve is designed for pilot operation of the relay valve. Simple and reliable, this valve readily mounts in a 7/8″ diameter hole on dashboards or control panels. The chrome-plated SMB-G618 valve is available for use in marine, offshore and natural gas applications, while the brass bodies SMB-618 valve is suitable for air applications only.

*SMB-618*

*SMB-G618*

*SMB-620*
*Black Push Button*

## Specifications

- Operating Temperature Range: -40 to 200°F (-40 to 93.3°C)
- Maximum Operating Pressure: 225 psi (15.5 bar)

## Push Button Control Valves

| Part Number | NPT Size Inlet – Outlet | Weight lb (kg) | Description |
|---|---|---|---|
| SMB-618 | 1/8" – 1/8" | .47 (.21) | Air-approved Push Button Valve |
| SMB-G618 | 1/8" – 1/8" | .48 (.21) | Gas-approved Push Button Valve |

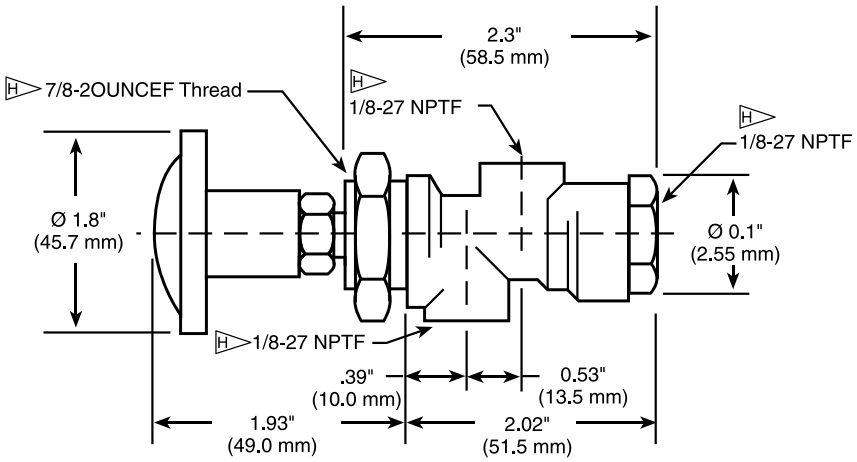
## Ingersoll Rand Replacement Parts

| Part Number | NPT Size Inlet – Outlet | Weight lb (kg) | Description |
|---|---|---|---|
| SMB-619 | .25" – 28 UNF | .05 (.02) | White Push Button |
| SMB-620 | .25" – 28 UNF | .05 (.02) | Black Push Button |

## Dimensions

**SMB-G618**

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.



# Air Strainers

Ingersoll Rand strainers are used in the air line to assure long starter life where air or gas is contaminated. The ST900 strainer screens the starter air utilizing a 300-mesh element reinforced on two sides by a 20-mesh internal stainless steel screen to ensure air integrity. The ST1000 strainers have stainless steel bodies and utilize 40-mesh stainless steel screens.

*ST900-267H/100*
*ST900-267H/150*
*ST900-267H/200*
*Strainer Housing*

## Maximum Working Pressure:

| Saturated Steam | Water, Oil, Gas | Compressed Air |
|---|---|---|
| 250 psi @ 400°F | 400 psi @ 150°F | 500 psi @150°F |
| 15.5 bar @ 204°C | 27.6 bar @ 66°C | 34.4 bar @ 66°C |

*ST900-266/100-HP*
*ST900-266/150-HP*
*ST900-266/200-HP*
*Strainer Element*

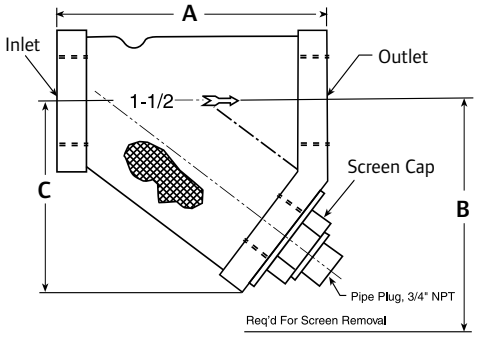
## ST900 Air Strainers (Housing + Strainer Element)

| Part Number | Thread Size Inlet - Outlet (NPT) | Weight lb (kg) | Strainer Element Replacement Part # |
|---|---|---|---|
| ST900-267/100-HP | 1" – 1" | 3.00 (1.36) | ST900-266/100-HP |
| ST900-266/150-HP | 1-1/2" – 1-1/2" | 2.66 (1.21) | ST900-266/150-HP |
| ST900-266/200-HP | 2" – 2" | 3.92 (1.78) | ST900-266/200-HP |

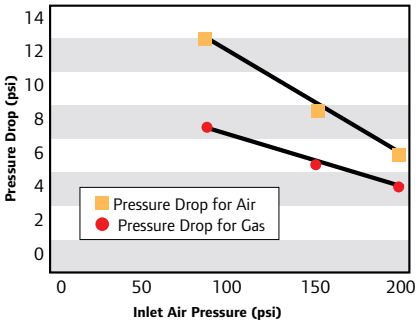
## Dimensions

| Part Number | Dim. A in. (mm) | Dim. B in. (mm) | Dim. C in. (mm) |
|---|---|---|---|
| ST900-267/100-HP | 4.00 (101.4) | 3.25 (82.6) | 2.62 (66.5) |
| ST900-267/150-HP | 4.72 (120.0) | 5.00 (127.0) | 2.99 (76.0) |
| ST900-266/200-HP | 5.51 (140.0) | 6.125 (155.6) | 3.54 (89.9) |

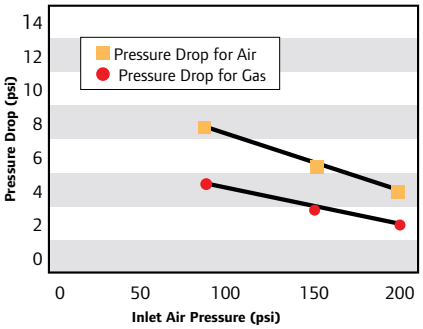
**Note:**
All dimensions shown are for reference only. Specifications subject to change without notice.



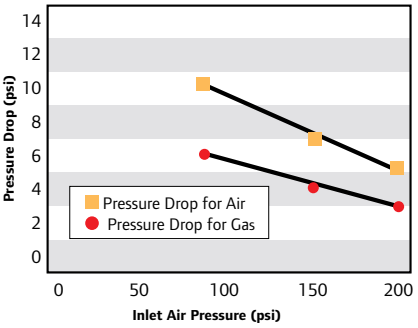

**1" Strainer**
Pressure Drop at 900 SCFM




**1-1/2" Strainer**
Pressure Drop at 1700 SCFM




**2" Strainer**
Pressure Drop at 3400 SCFM



# Mufflers

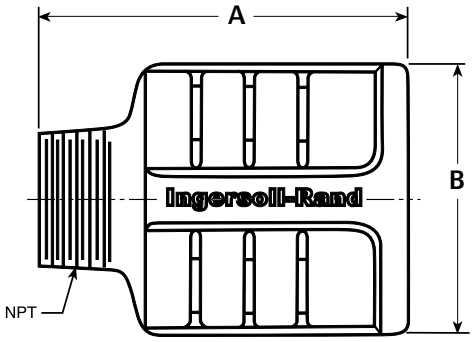
Ingersoll Rand mufflers are designed to effectively limit starting noise levels.

## Specifications

- Low back pressure provides minimal power loss for full starter power
- Effective sound attenuation for low noise level
- Non-freezing for reliable operation
- Self-cleaning to eliminate clogging and ensure longer life while reducing maintenance time
- Capable of direct or remote mounting for flexibility of application

## Dimensions

**Note:** All dimensions shown are for reference only. Specifications subject to change without notice.




## Mufflers

| Part Number | NPT Size | Dim. A in. (mm) | Dim. B in. (mm) | Weight lb (kg) | For Model Series |
|---|---|---|---|---|---|
| 3BM-WM07 | 3/4" | 7.18 (182.37) | 2.22 (56.37) | .83 (0.38) | 3BM, 5BM (Older Housing) |
| 3BM-A674 | 1" | 8.66 (219.96) | 3.85 (97.79) | 1.19 (0.54) | 3BM, 5BM (New Housing) |
| 150BM-A674 | 1-1/4" | 4.21 (106.9) | 3.34 (84.8) | 1.50 (0.68) | 150BM, SS175 |
| SS350-A674 | 1-1/2" | 4.56 (115.8) | 3.31 (84.1) | 1.13 (0.50) | SS350 |
| 150T-312 | 2" | 5.50 (139.7) | 2.75 (69.85) | 1.85 (0.84) | 150T, ST500 |
| SS800-A674 | 2-1/2" | 6.66 (169.21) | 4.75 (120.77) | 3.35 (1.52) | SS800 |

*3BM-WM07*

*3BM-A674*

*150BM-A674*

*SS350-A674*

*150T-312*

*SS800-A674*

# In-Line Lubricators

## Specifications

- Reservoir: 1/2 Pint Metal
- Maximum Operating Temperature = 175°F (79°C)
- Maximum Operating Pressure = 250 psi (17.2 bar)
- C = 26
- Media: Air, clean natural gas (see circular letter A-1077)
- Recommended Operating Flow Range at 100 psig (6.9 bar): 160 to 600 scfm (78 to 283 dm3/s)
- Recommended Lubricants: This lubricator will perform satisfactorily using misting type oils rated 150 to 200 SSU (Saybolt seconds) @ 110°F (38°C)
- Material Construction: Body = Aluminum — Reservoir = Steel
  Sight-Feed Dome = Pyrex & Aluminum
  Elastomers = Neoprene & Buna-N

*NL-8-8*

*NL-24-8*

## Installation

- Air line piping should be same size as lubricator ports.
- Install lubricator vertically (sight-feed dome up) in air line downstream of filter and regulator as near as possible to the device being served. This lubricator may be installed upstream or downstream of directional control valves.
- Connect piping to proper ports using pipe thread sealant on male threads only. Do not allow sealant to enter interior of lubricator. Air flow must be in direction of arrow on side of body.
- Remove fill plug and fill reservoir with a good quality lubricant to 3/4″ below bottom of threads on dipstick. Do not overfill.

**Warning**

These units must not be used where pressure or temperature may exceed maximum rated operating conditions. See specifications.

In lubrication applications, some oil mist may escape from the point of use into the surrounding atmosphere. Users are referred to OSHA safety and health standards for limiting oil mist contamination and utilization of protecting equipment.

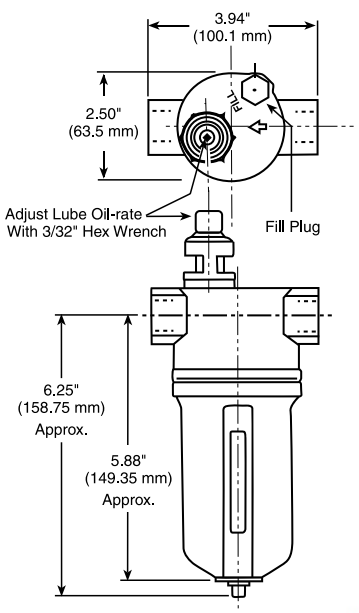
## Adjustment

- Adjust drip rate only when there is a constant rate of flow through the lubricator.
- Determine the average rate of air flow (scfm) through the lubricator, then adjust the needle valve using a 3/32″ allen wrench to obtain the recommended drip rate (Drops/min). Turn needle valve counterclockwise to increase and clockwise to decrease the drip rate.
- Monitor the device being lubricated for a few days following initial adjustment. Readjust the drip rate if the oil delivery at the device appears either excessive or low.

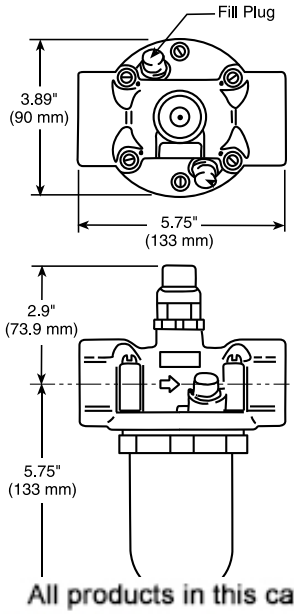
## In-Line Lubricators

| Part Number | Port Thread Size NPT Inlet – Outlet | Weight lb (kg) |
|---|---|---|
| NL-8-8 | 1/2" – 1/2" | 1.70 (.77) |
| NL-24-8 | 1-1/2" – 1-1/2" | 2.70 (.1.22) |
| NL24-TK1 | N/A | .05 (.02) |

**NL-8-8**

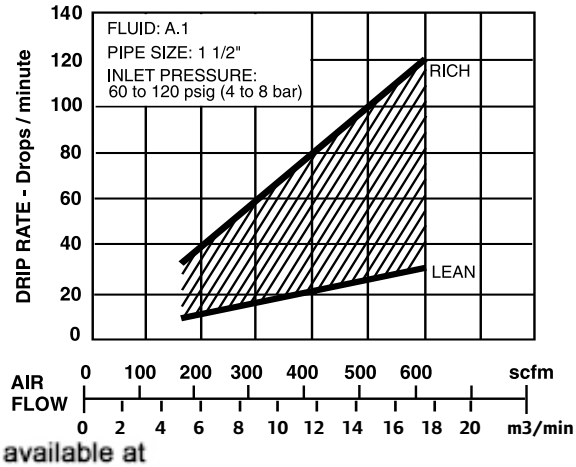



**NL-24-8**




## Recommended Drip Rate

Recommended Drip Rate Settings for Average Lubrication



# Regulators

## Rated Operating Conditions

- Inlet Pressure: 10 to 450 psig (0.7 to 31 bar)
- Maximum Outlet Pressure: 250 psig (17.2 bar)
- Temperature: 0° to 175°F (-18° to 79°C)
  - With dewpoint less than air temperature below 35°F (2°C)
- Air Consumption: 2200 scfm @ 150 psi

*NR-24-8 Pilot Operated Regulator with Integral Pilot*

## Specifications

- Fluid: Compressed Air
- Type: Relieving
- Ports: Main: 1-1/2″ or 2″ NPT
  Gauge: 1/4″ NPT
  Exhaust (relieving models only): 3/4″ NPT
- Outlet Pressure Adjustment Range:
  10 to 250 psig (0.7 to 17.2 bar)
- Threads: Use SMB-441 sealant on threads of air line fittings. Apply sealant evenly to threads only. Excessive sealant may interfere with valve operation.

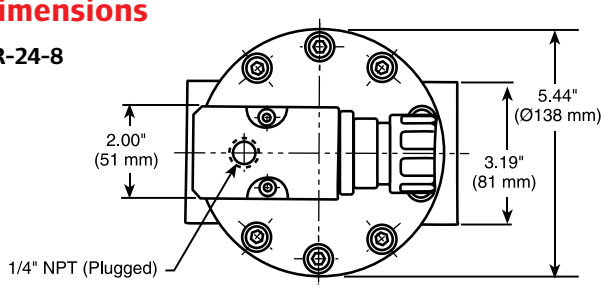
Outlet pressure adjustment ranges are not minimum or maximum outlet pressure limits. Regulators can be adjusted to zero psig outlet pressure and, generally, to pressures in excess of those specified.
The use of these regulators to control pressures outside of the specified ranges is not recommended.

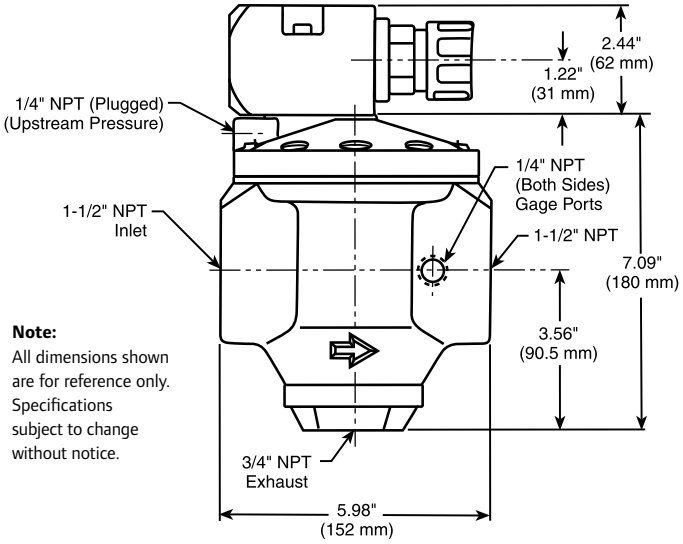
## Regulators

| Part Number | Description |
|---|---|
| NR-24-8 | Pilot Operated Regulator with Integral Pilot (1-1/2" NPT) |
| NR-24-8-2 | Pilot Operated Regulator with Integral Pilot (2" NPT) |
| NR24-TK1 | NR-24-8 Tune Up Kit |

## Dimensions

**NR-24-8**




**Note:**
All dimensions shown are for reference only. Specifications subject to change without notice.

# At Your Service

## *Installation Configurations*



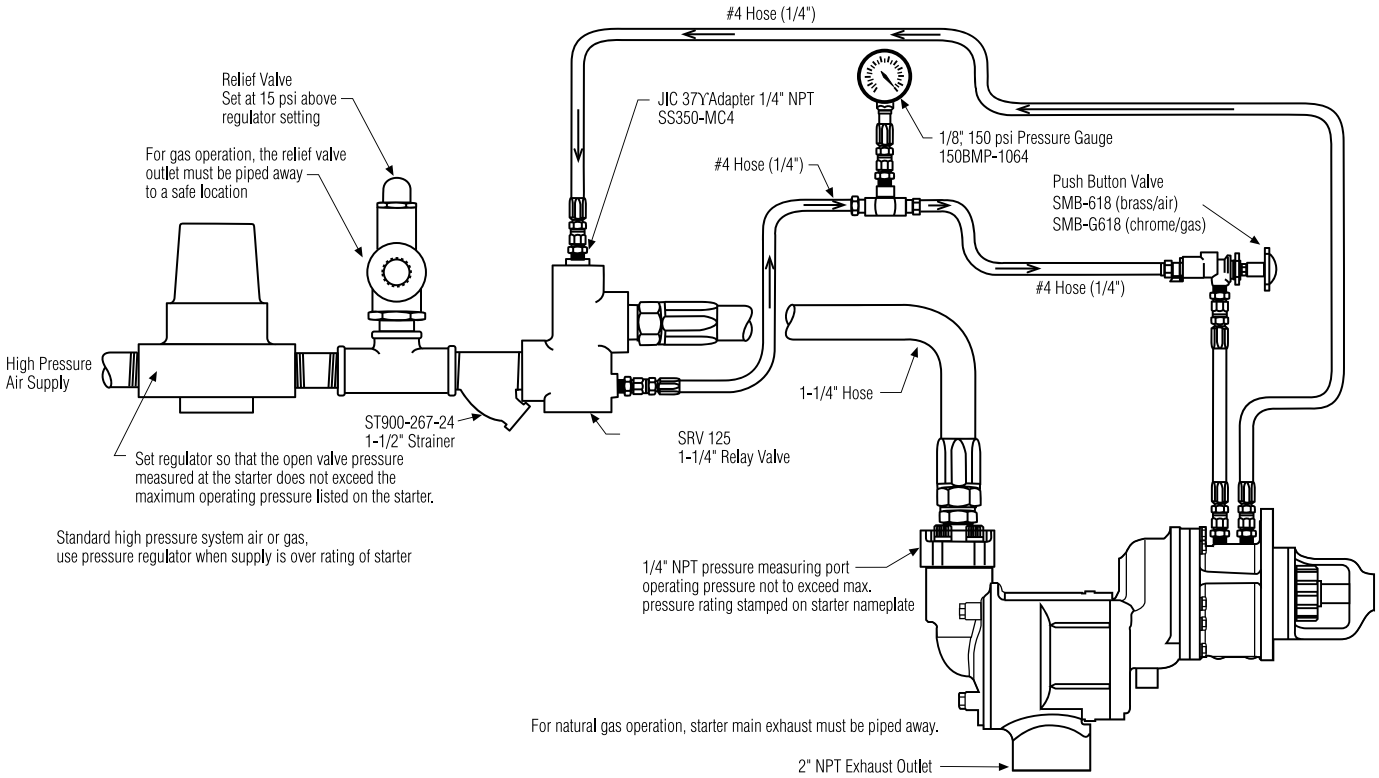




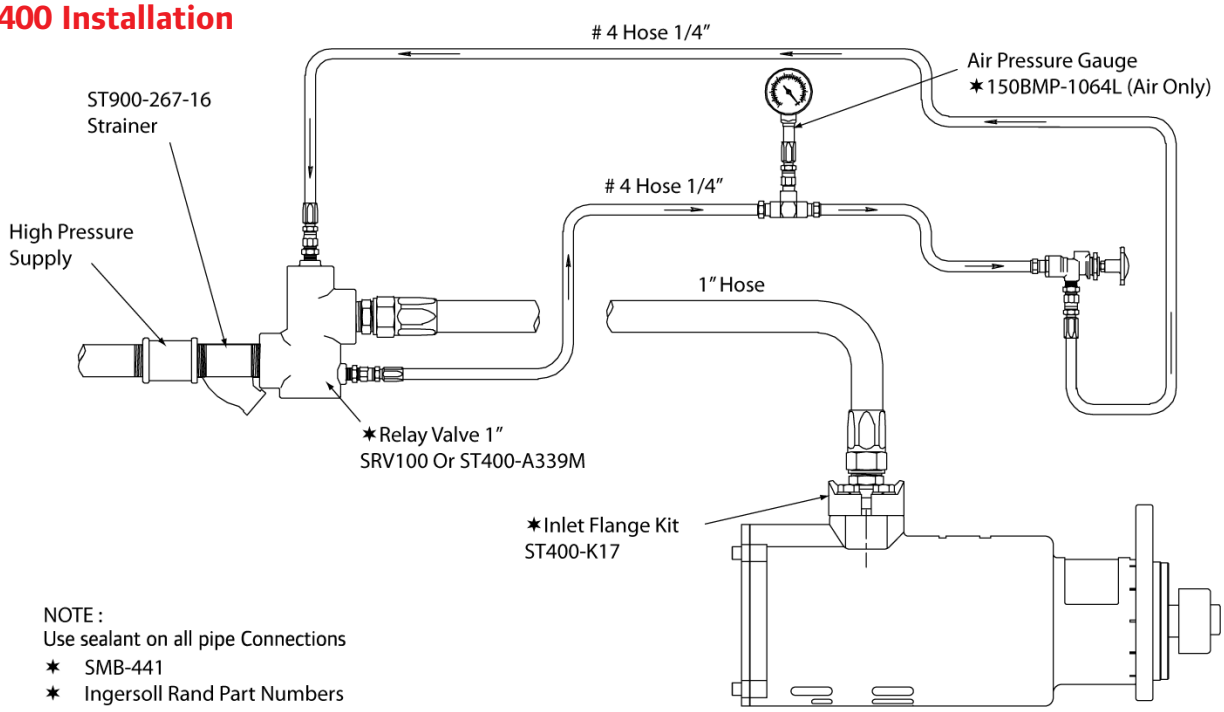
Ingersoll Rand

# Installation Configurations

## 150 & ST500 Stationary - Gas



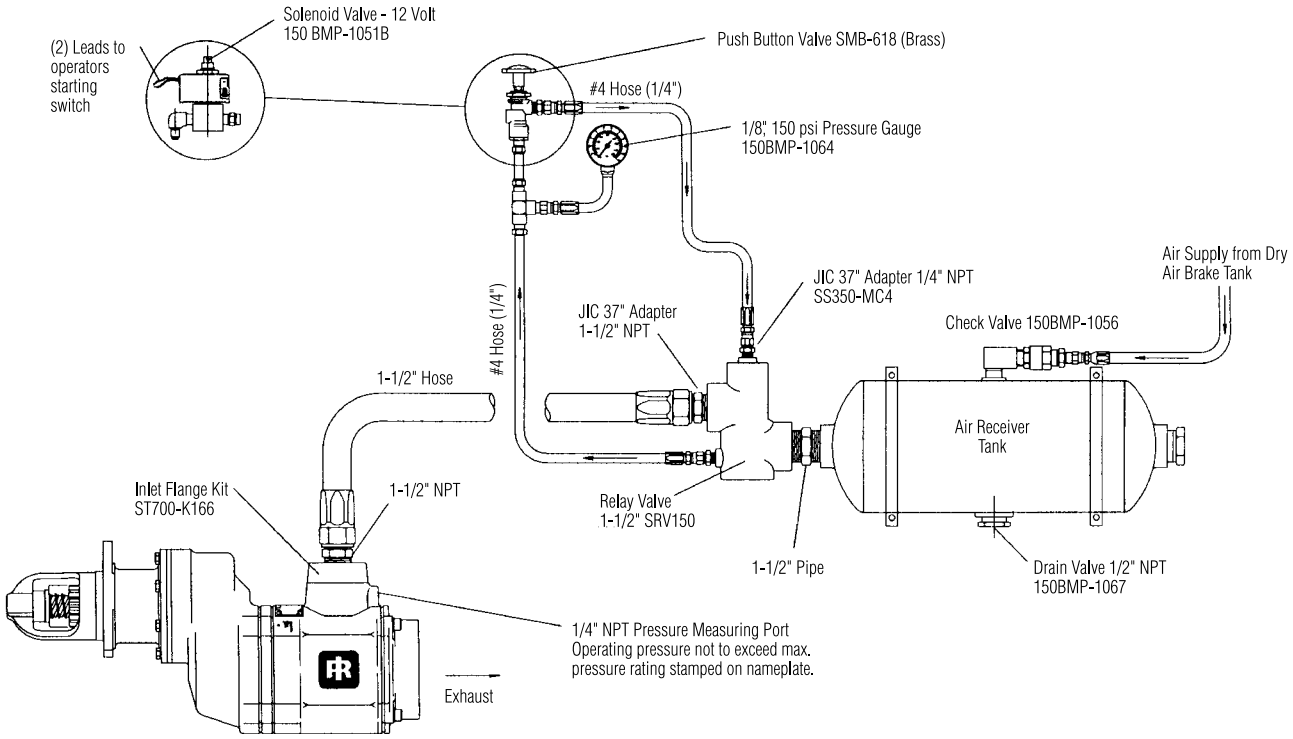

## ST400 Installation



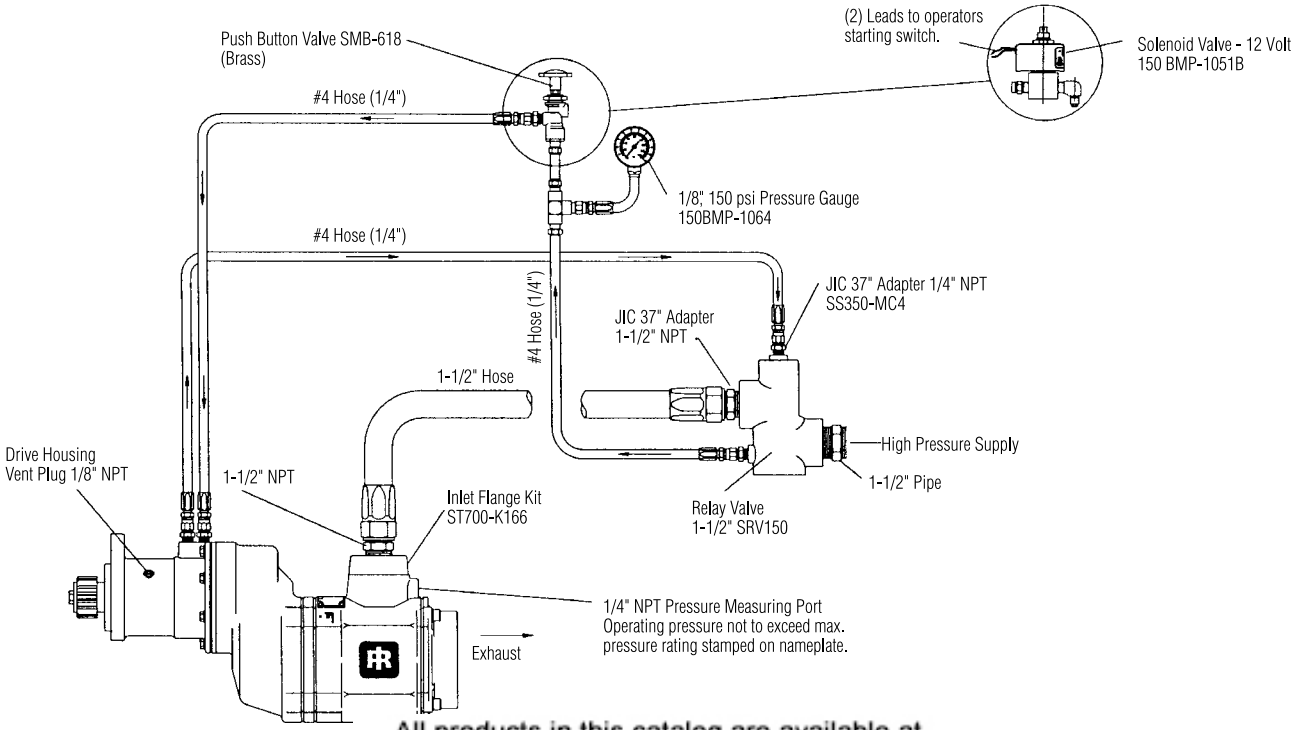

NOTE :
Use sealant on all pipe Connections
✶ SMB-441
✶ Ingersoll Rand Part Numbers

# Installation Configurations

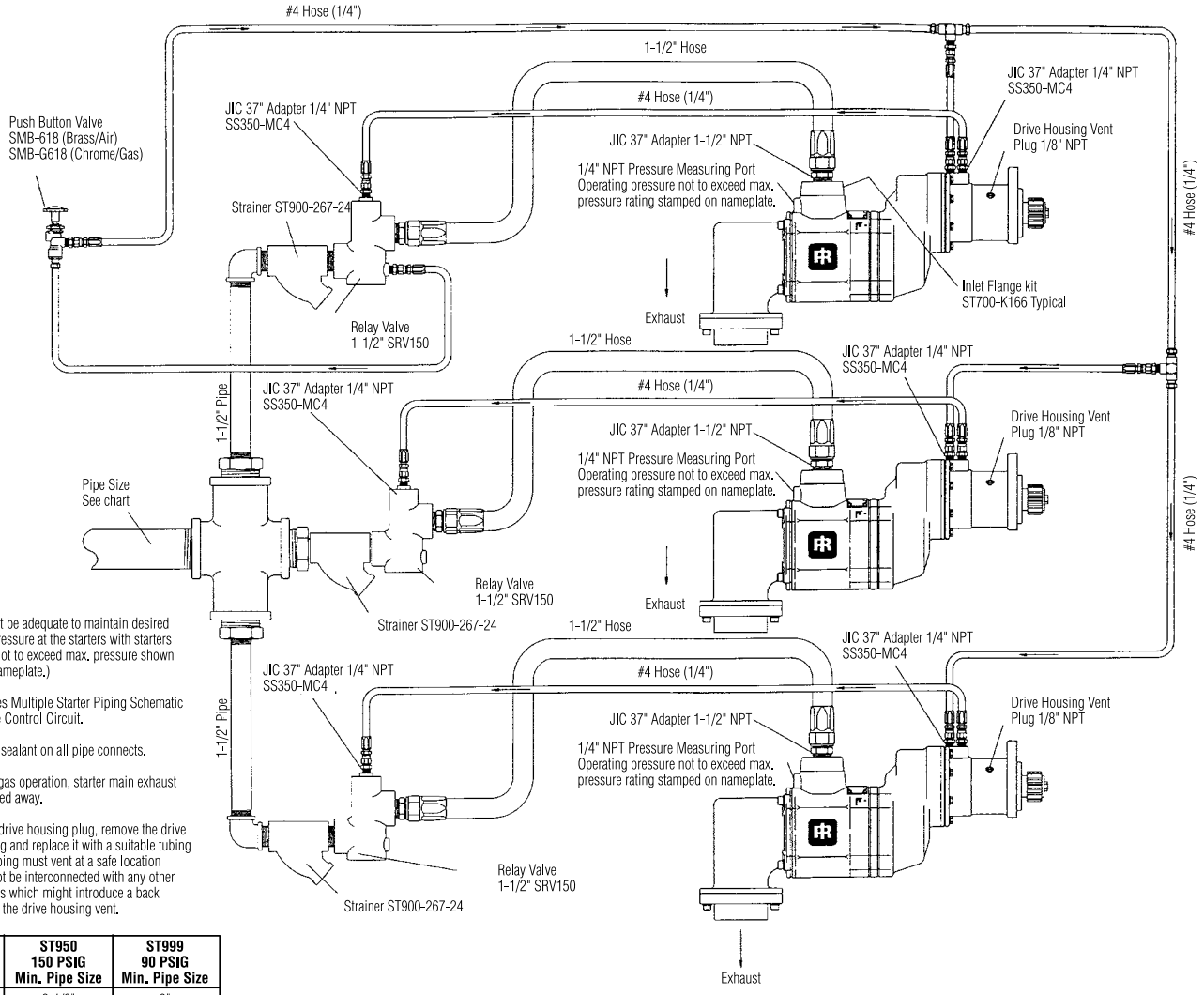
## ST700/ST900/ST1000 Inertia Installation




## ST600/ST700/ST900/ST1000 Typical Stationary Installation



## ST600/ST700/ST900/ST1000 Typical Multiple Starter Application Installation




Supply must be adequate to maintain desired operating pressure at the starters with starters running. (Not to exceed max. pressure shown on starter nameplate.)

ST900 Series Multiple Starter Piping Schematic showing the Control Circuit.

NOTE: Use sealant on all pipe connects.

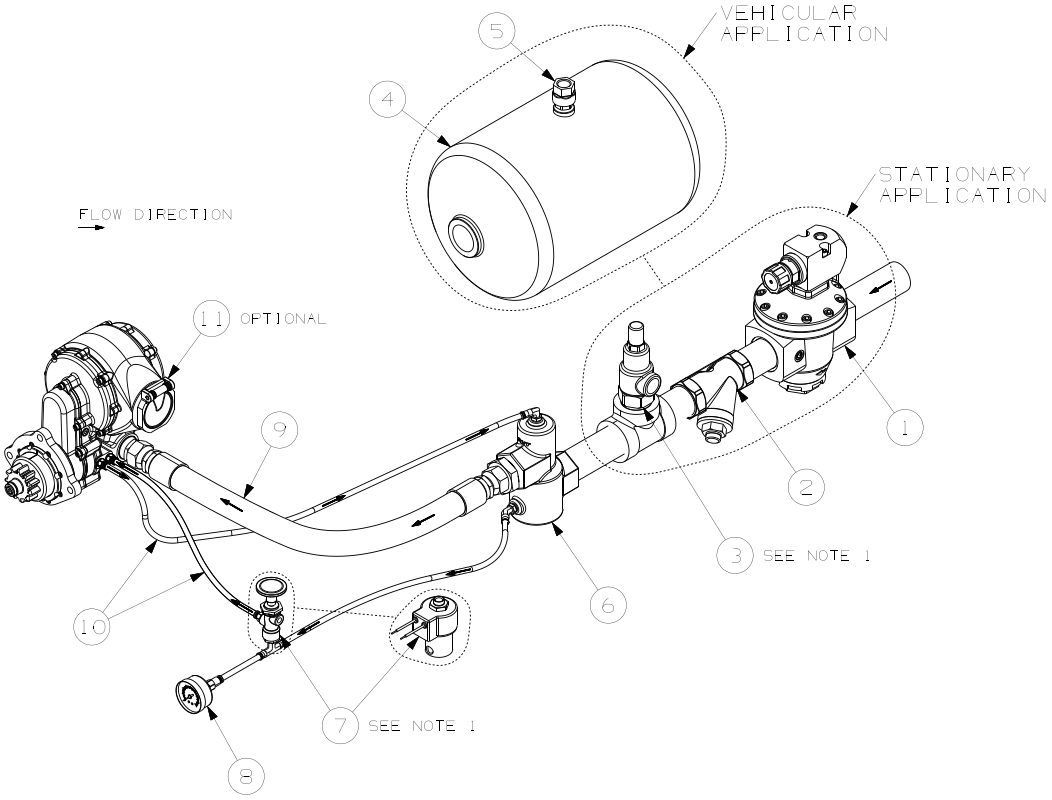
For natural gas operation, starter main exhaust must be piped away.

To pipe the drive housing plug, remove the drive housing plug and replace it with a suitable tubing line. The tubing must vent at a safe location and must not be interconnected with any other exhaust lines which might introduce a back pressure on the drive housing vent.

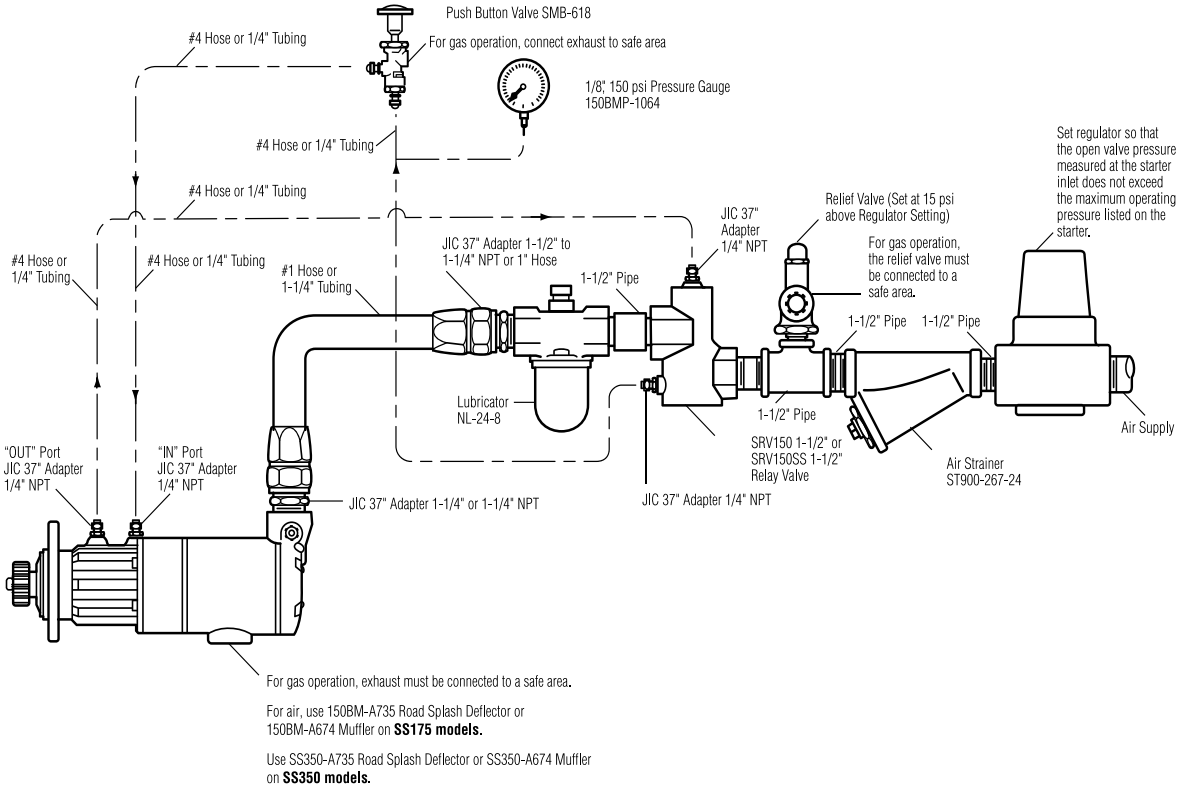
| No. of Starters | ST950 150 PSIG Min. Pipe Size | ST999 90 PSIG Min. Pipe Size |
|---|---|---|
| 2 | 2-1/2" | 3" |
| 3 | 3" | 3-1/2" |
| 4 | 3-1/2" | 4" |
| 5 | 3-1/2" | 4" |

# Installation Configurations

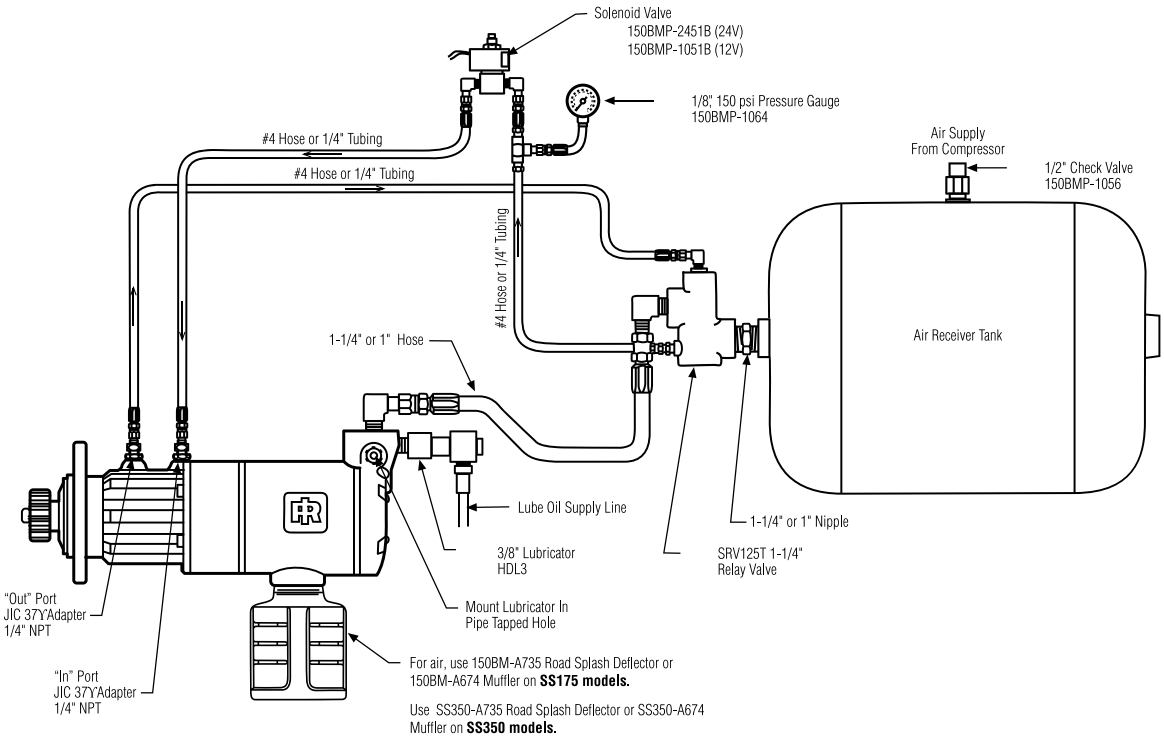
## 150BMP and SS100 Typical Installations



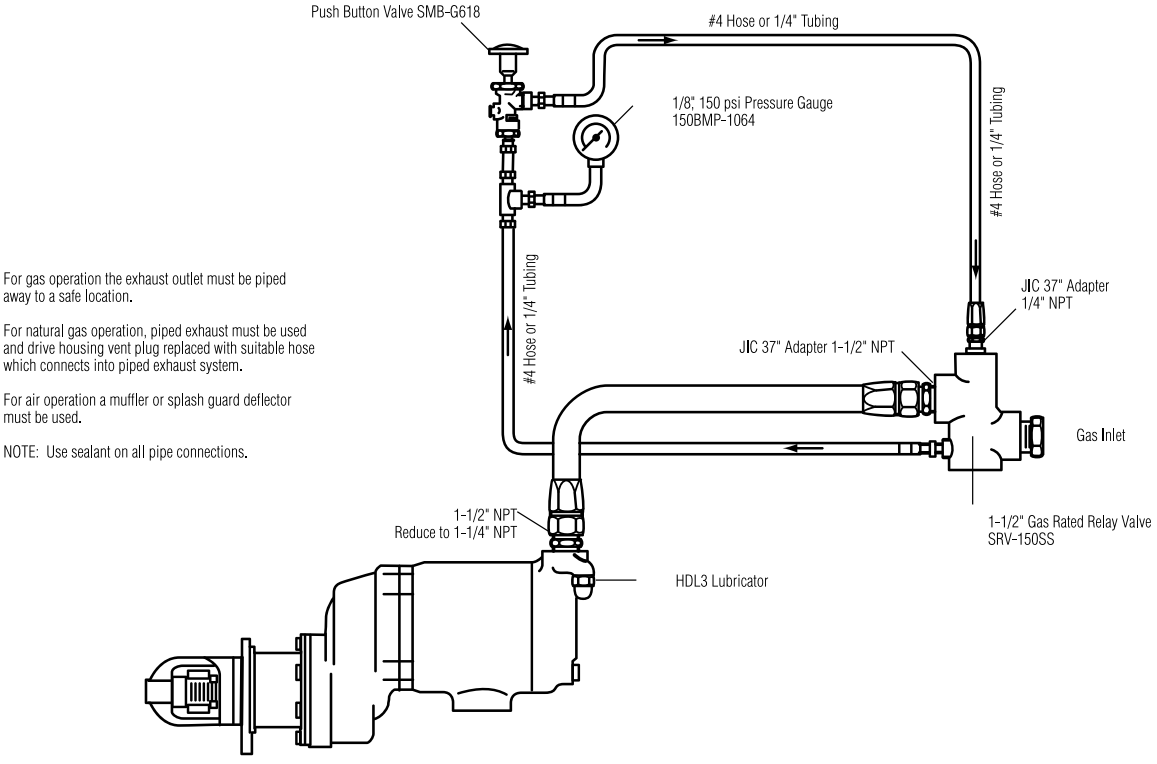

## SS350/150MPE Stationary Installation



## SS350/150BMPE Typical Vehicular Installation




## 150BMG (Gas) Stationary Installation




For gas operation the exhaust outlet must be piped away to a safe location.

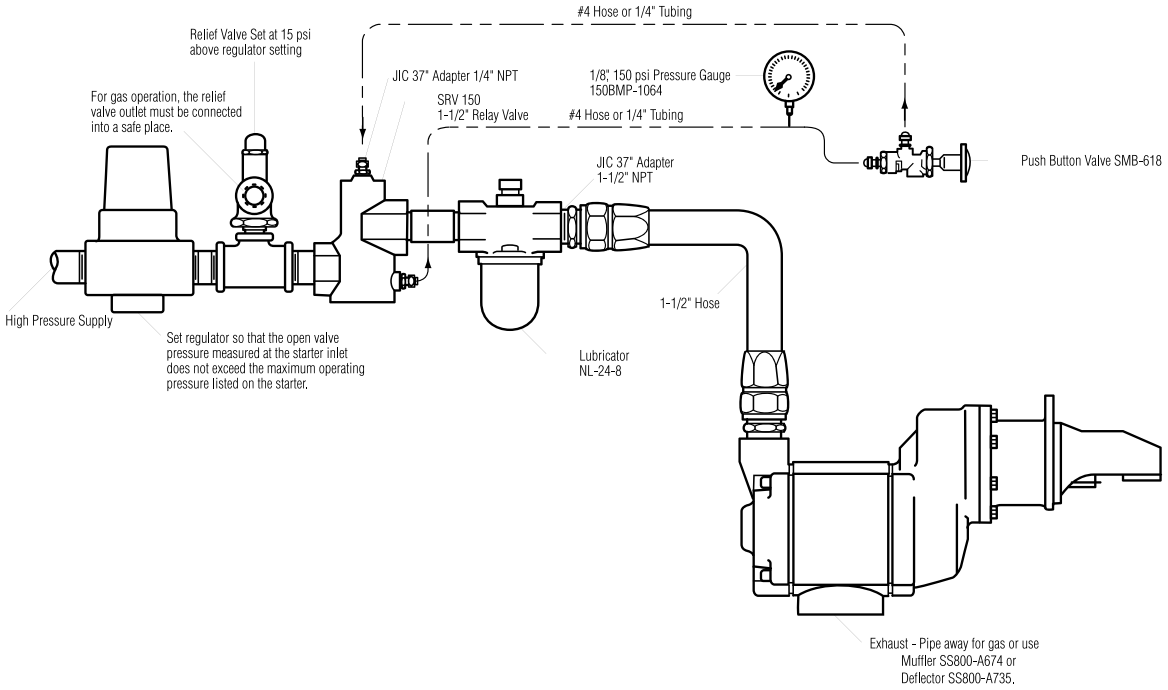
For natural gas operation, piped exhaust must be used and drive housing vent plug replaced with suitable hose which connects into piped exhaust system.

For air operation a muffler or splash guard deflector must be used.

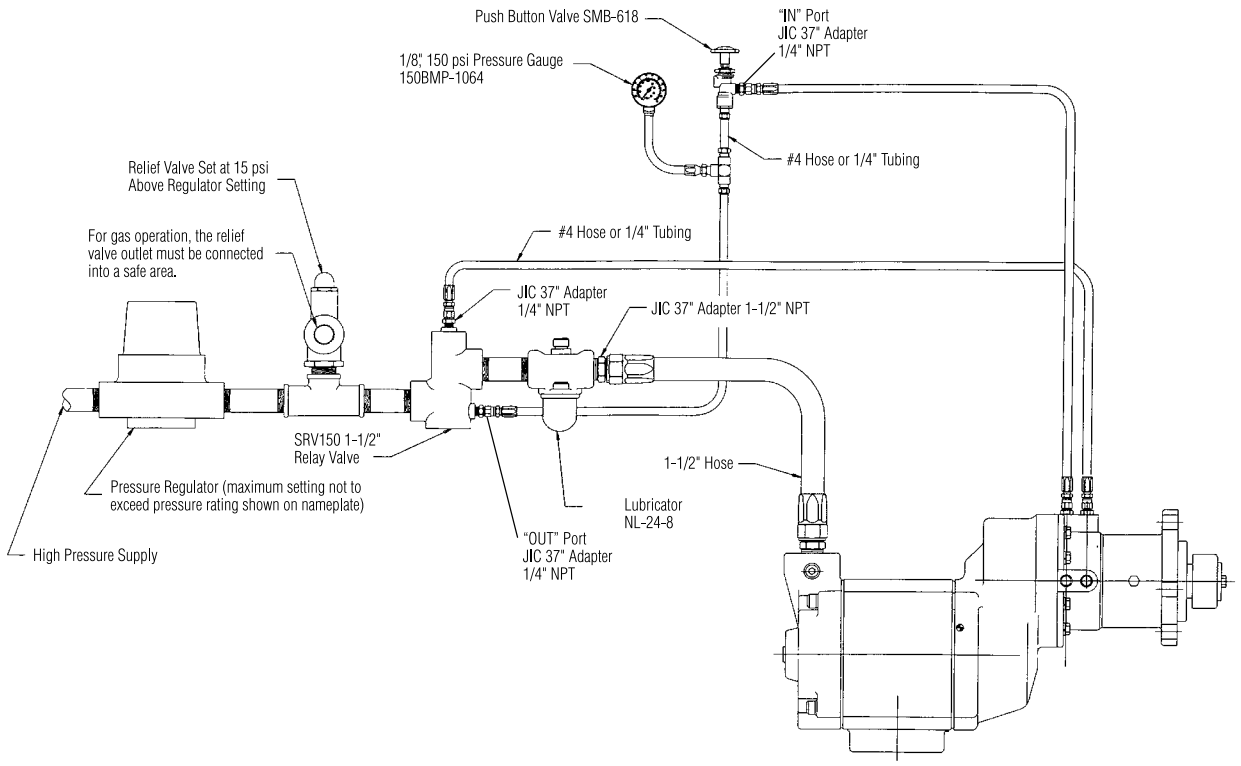
NOTE: Use sealant on all pipe connections.

# Installation Configurations

## SS810 Typical Stationary Installation




## SS815/SS825/SS850 Typical Stationary Installation



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